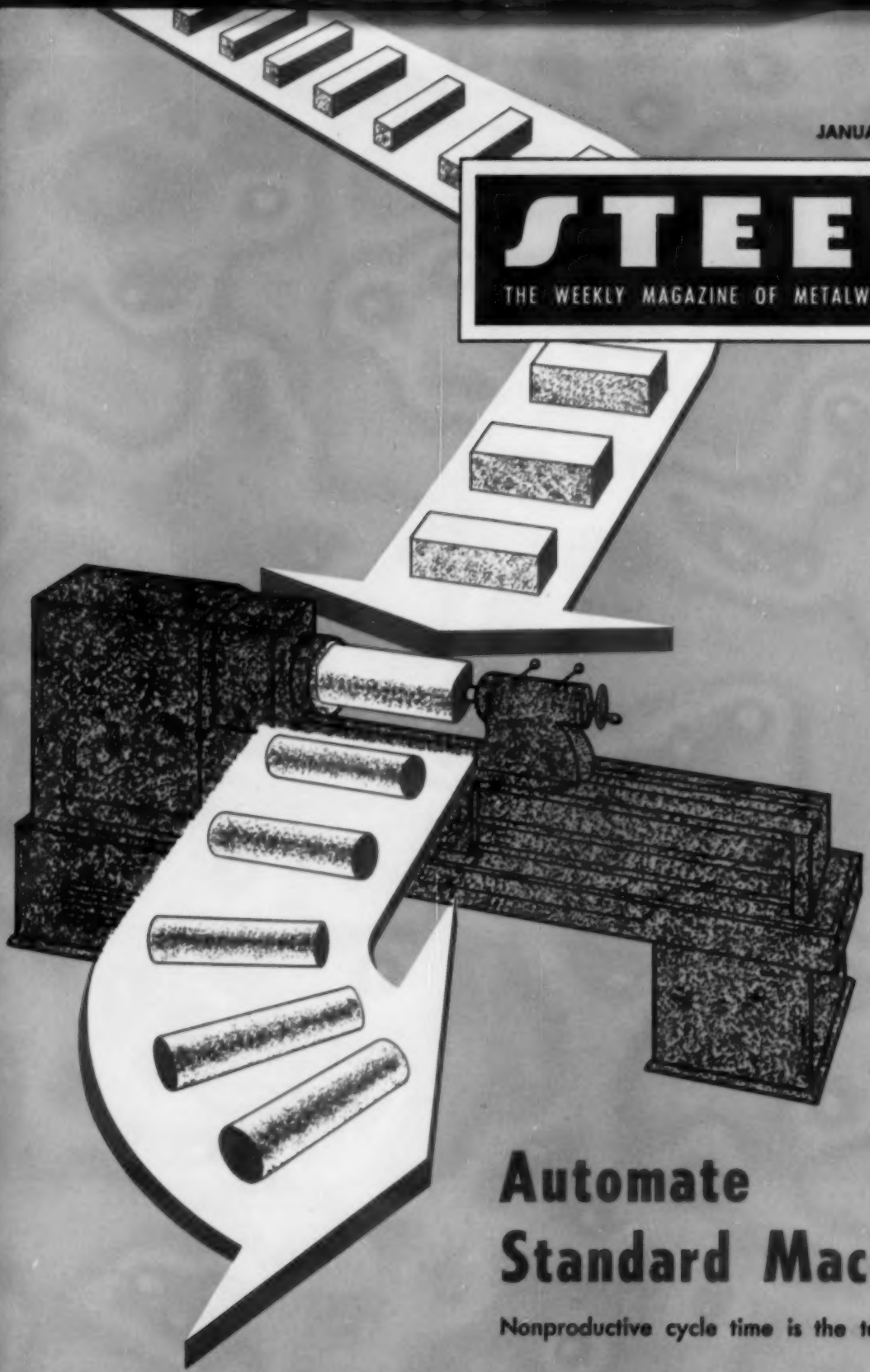
JANUARY 17, 1955

STEEL

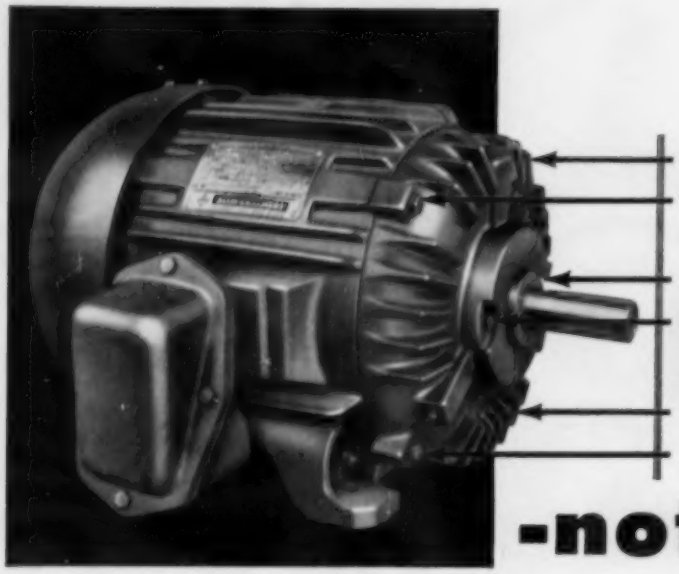
THE WEEKLY MAGAZINE OF METALWORKING



Automate Standard Machines

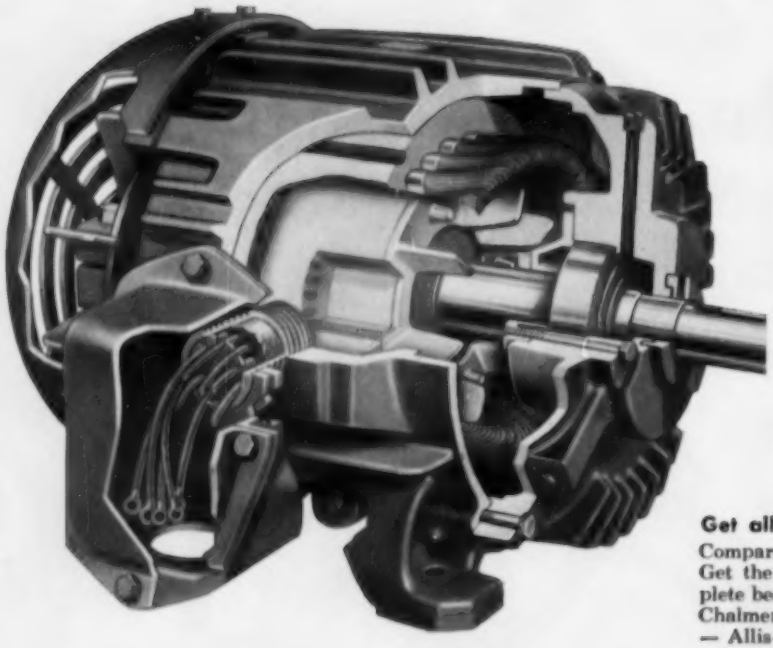
Nonproductive cycle time is the target, p. 72

✓ **PROXY BATTLES**
How To Stop Them, p. 42



It takes Six Bolts -not just four

to give full bearing protection for greater motor performance



THE TWO EXTRA BOLTS in the end housing of every Allis-Chalmers ball bearing motor are the proof of *extra* protection against bearing failure. These are the bolts that hold the bearing cap tightly in place against the inner face of the bearing enclosure. This cap, with its close running clearances, keeps grease from the interior of the motor . . . retains an ample supply within the bearing enclosure . . . protects the grease and the bearing against contamination from dirt and moisture.

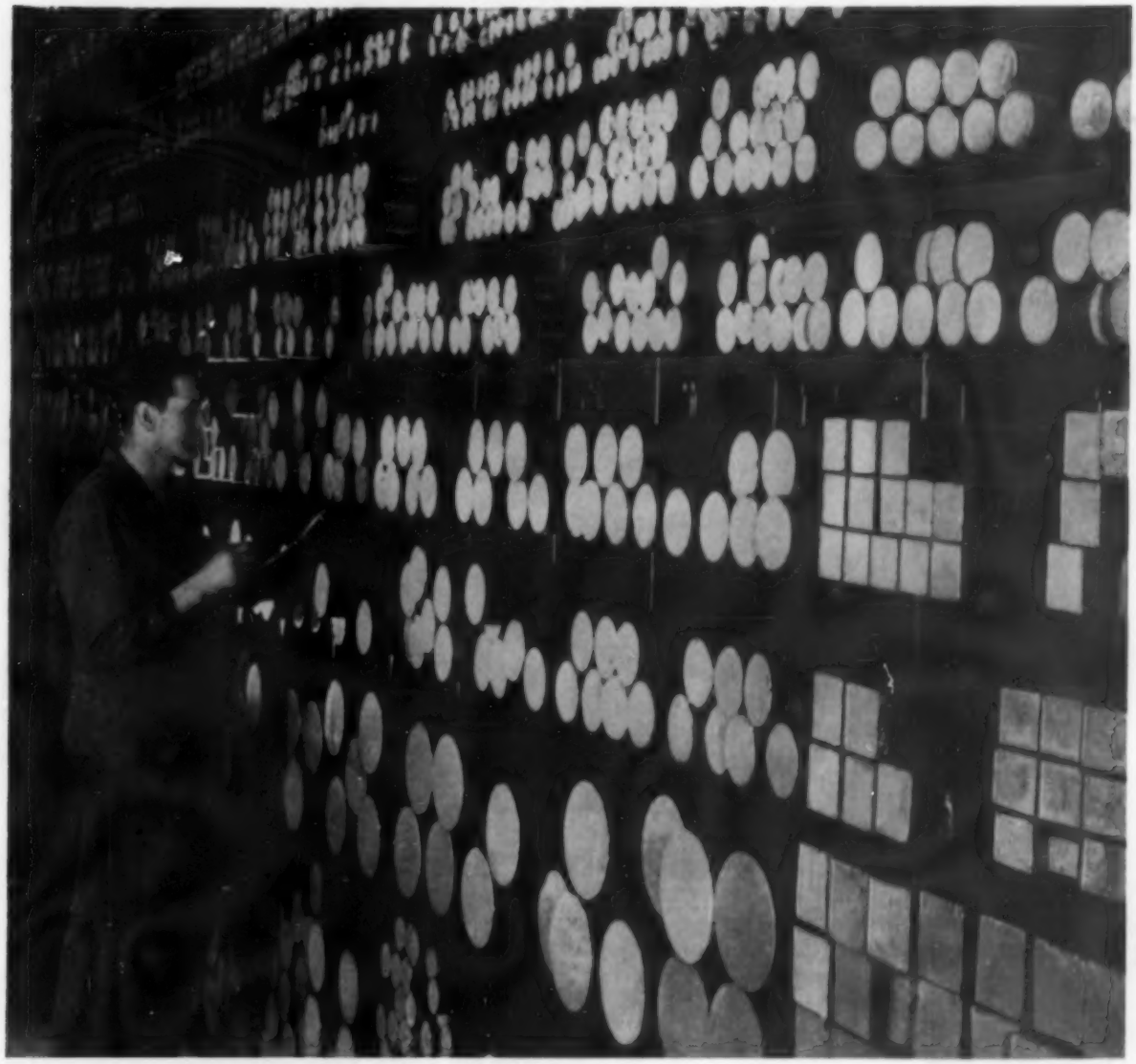
At the outer side of the bearing, double labyrinth seals keep grease in, also keep dirt out. What's more, large grease reservoirs act as additional dirt traps.

Result? Allis-Chalmers motors pay off in longer, trouble-free bearing life, lower motor maintenance.

Get all the facts . . . judge for yourself — Compare Allis-Chalmers motors with other motors. Get the six-bolt construction that gives you complete bearing protection. For proof, see your Allis-Chalmers Office or Authorized Distributor, or write — Allis-Chalmers, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

A-4540



Want Fast Tool Steel Service?

SEE YOUR BETHLEHEM DISTRIBUTOR

Whether you want to order a short bar of tool steel, or merely wish advice about some phase of heat-treating, you're sure to find your Bethlehem tool steel distributor anxious to be of service.

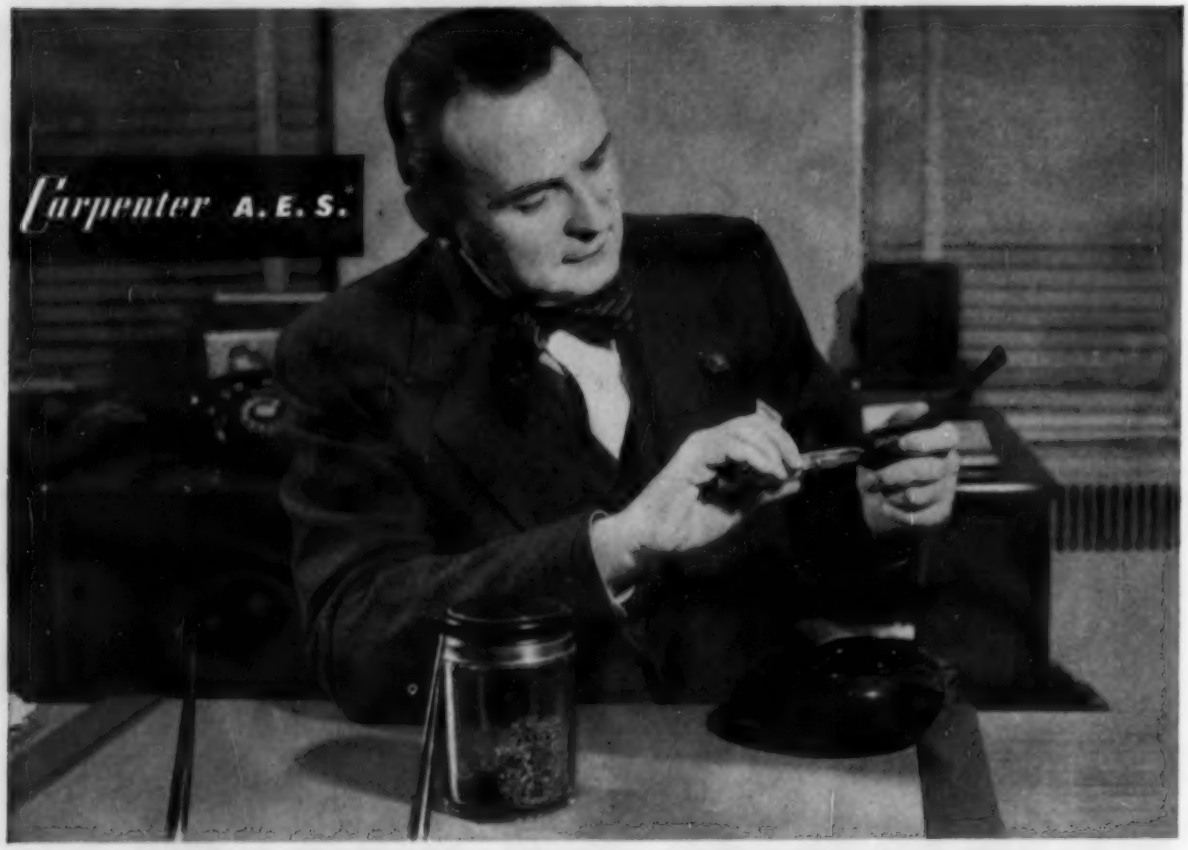
Prompt service is your distributor's middle name. Why else does he make it a point to know your city like a book—its background, its people, its industry? He knows what steels you are most likely to need, and in what quantities. And so he keeps large stocks of Bethlehem tool steel on hand, in a variety of types, ready to go at a moment's notice.

If you want bars cut to special length, or if there's some tricky phase of metallurgy or any other tool steel problem troubling you, again your distributor is at your beck and call. He's a real friend. They don't come any better. It will pay you to get to know him.

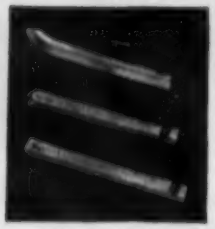
BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL



Good News for Pipe Smokers



*Another example of how Carpenter *Application Engineering Service is helping industry cut costs, build sales.*

Once a good pipe is "broken in", you can look forward to many hours of smoking pleasure. That is, provided you have an easy way to keep the inside of the pipe bowl in good shape. That's the reason for this reamer type pipe cleaner. You simply insert it in the bowl, turn the expanding blades to fit, then rotate the cleaner to remove excess "cake". These cleaners now sell all over the country . . . but here's the interesting story on how the manufacturer hurdled problems in perfecting the device:

The "heart" of the cleaner is in the cutting blades. For these, the manufacturer was using cold rolled steel, chrome plated. However, plating costs were too high . . . running 7c per blade. Also, plating produced a rounded, inefficient cutting edge. And to make matters worse, one out of three plated blades had to be rejected.

At this point the manufacturer called in Carpenter and Application Engineering Service went to work. The Carpenter representative recommended a *stainless* steel, Carpenter No. 5, Type 416. Results: Plating costs are eliminated, blades take and hold sharp edges to make a vastly improved product . . . and rejects are a thing of the past.

On product after product . . . from kitchen cutlery to parts for critical instruments . . . Carpenter Application Engineering Service has helped industry find the one steel best suited to cut costs, improve performance. For A.E.S. brings to your designers, purchasing men and production heads the benefits of almost 70 years' experience in applying specialty steels. This program has been the guiding force behind improved steels and totally new steels by Carpenter to make possible the "impossible". A.E.S. goes to work for your plant as soon as you get in touch with Carpenter. THE CARPENTER STEEL COMPANY, 139 W. Bern St., Reading, Pa.

Carpenter STEEL — Tool, Alloy and Stainless Steels

Pioneering in Improved Tool, Alloy and Stainless Steels Through Continuing Research

Fast Figurework and Printed Proof with the All-Purpose Printing Calculator

Manufacturers need only *one* machine – the Remington Rand Printing Calculator – to do all their figurework faster and better than ever before. Then, too, the Model 99 prints all essential elements, and only the essential elements, on its *exclusive*, two-color, easy-to-read Simpla-Tape. This time-saving feature eliminates reruns for checking and gives you a permanent record for your files.

The Printing Calculator is truly an *all-purpose* machine. This *one* machine may be used to compute payrolls, prorate expenses, distribute costs, compile sales reports, extend invoices, analyze invoices, to name a few. The Printing Calculator does all these jobs because it automatically divides and multiplies . . . electrically adds and subtracts. And anyone can use the Model 99 . . . for touch operation of its simplified, ten-key keyboard can be easily learned.

These applications of the Model 99 to typical plant figurework are shown in free folders C639.1 thru .10. Send for your copies. Learn how this great machine can completely revitalize your figurework departments.

Points of Interest at Plant Maintenance Show

Manufacturing executives who attended the Maintenance Show were particularly interested in Remington Rand's latest Preventive Maintenance Control Systems shown there. Now you can get complete details on these remarkable systems by checking off X1383 in the coupon below. This informative booklet contains a wealth of valuable management aids. For example, it shows how you can set up a well-integrated Maintenance Program which will protect capital investment, cut down time and product costs. Sched-U-Graph Controls are described which assure increased efficiency on the part of each worker, higher output and less waste. It also explains how you can reduce inventory investment, production stoppage and overtime with Kardex Visible Records with movable Graph-A-Matic signals which focus attention on items nearing reorder point. Send for X1383.

A Decade of Facts at His Finger Tips

In these five Kardex Imperial cabinets, William Esch, cost accountant for Warner Brake & Clutch Co., has at his finger tips the exact cost figures for every job the factory has handled for the past ten years. With this information, it is a simple matter for him to prepare future production cost estimates on the basis of previous performance. That's

why this company has been able to arrive at realistic prices based on accurate costs in a highly competitive market. Kardex cost control records proved just as valuable for the Reed-Prentice Corporation, too. Learn how Kardex Visible Systems can give you the same close cost control. Send for Case History Reports No. 942 and No. 945.

Remington Rand

Room 1192, 315 Fourth Ave., New York 10

Please see that I have the free brochures circled below:

C639.1 thru .10

CH942 CH945 X1383

Name & Title_____

Firm_____

Address_____

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---Profit-Building IDEAS For Business---

NEW ATOMIC CANNON

Added Evidence that—

Everyone Can Count on VEEDER-ROOT

This mobile 280 mm. atomic cannon has *two* recoil motions. The primary recoil absorbs the cannon's "kick". The secondary recoil (something new in artillery) absorbs the forces created by the primary recoil. And each recoil motion is recorded by this special Veeder-Root Counter designed with a plunger-action shaft . . . which keeps the score on the cannon's use and indicates approaching need for maintenance.

This again points up the fact that "Anything Worth Making — or Worth Doing — *Is Worth Counting.*" And Veeder-Root has the experience and resources *you* can count on, to give you any counter you need . . . for any mechanical or electrical application . . . in any field from Atomics to Automation. Write:

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HARTFORD 2, CONNECTICUT

Chicago 6, Ill. • New York 19, N. Y. • Greenville, S. C.
Montreal 2, Canada • Dundee, Scotland
Offices and Agents in Principal Cities

"The Name that Counts"

This Week in Metalworking

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

Vol. 136 No. 3 January 17, 1955

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A MARK to Remember

For over three quarters of a century, the Seymour trade mark has been a symbol for the finest quality NICKEL SILVER — PHOSPHOR BRONZE — BRASS — NICKEL ANODES — BRIGHT NICKEL PROCESSES — WELDING RODS and other non-ferrous products.

It has also been a symbol for Seymour SERVICES — speedy, same-day acknowledgment of orders and inquiries — expert engineering and metallurgical help in selecting and specifying non-ferrous metals for special applications.

Fine, dependable products and fast, friendly service . . . these are the qualities which have made the Seymour sunburst a trade mark to remember.

In the months ahead you will see and hear a lot more about Seymour and the products it manufactures. The news will come from Seymour distributors and Seymour representatives.
Watch for it. Listen for it.
MARK IT WELL!

THE SEYMOUR MFG. CO.
500 FRANKLIN STREET
SEYMOUR, CONN.
NEW YORK SALES OFFICE:
CHANIN BUILDING — CABLE, SEYMOURCO

Your machining department for hardened and precision ground screw machine products. Send for brochure & equipment list.
Ottawa
OSP INC.
OTTAWA STEEL PRODUCTS
STEEL PRODUCTS INC.
Grand Haven Michigan

behind the scenes

A Scanty Request

The ladies and gentlemen who work for STEEL enjoy their work and their associates. Working conditions are pleasant, chores are interesting as well as challenging, and all the workers are well balanced and well adjusted. In reporting what goes on behind the scenes, we frequently prowl about in the vain hope of uncovering an exciting scandal—you know, like a good rousing fight between editors, or the news that a correspondent had run off with the switchboard operator's grandmother, or that Copy Editor Harry Chandler had inadvertently told one of his anecdotes to a dictaphone. We never have any luck: that STEEL crowd is too well mannered to provide hot copy.

Sometimes, however, somebody slips—and ol' Shrdlu is right there, like Johnny at the rat hole. Our innocent victim this week is the very polite and feminine Mary Ann Stuve, Editorial Assistant in the Technical Section. One day last week she called the Composing Room, and asked for some flimsies. (Flimsies are page proofs printed on exceptionally thin and transparent tissue paper.) Honest Frank Giel, Assistant Foreman, always anxious to oblige a lady, asked her to repeat her request, so he could get it straight.

The lady sighed. What good had come of all that How-Now-Brown-Cow stuff she had studied at Valparaiso?

"Please," said Mary Ann, "send up some flimsies right away to the Sex Tection."

From Mouths Of Babes

Parents are naturally proud of the clever remarks uttered by their progeny, but sometimes their pride is mixed with puzzlement. Assistant Managing Editor John Morgan, aiming to relax for a moment while the Metalworking Yearbook was being assembled, permitted himself to be lured away to a formal dance. Trembling like a horse being broken to harness, he allowed himself to be arrayed from head to foot in the fancy trappings that are *de rigueur* at such affairs, and when he was fully attired he presented himself to his six year old daughter. "Goodnight, sweetheart," he said, bending over her crib.

She eyed him with amazed delight, breathlessly taking in the gleaming shirt, the twinkling studs, the elegant tails. Swarming over him with the passion of a television gun moll, she murmured, "Goodnight, Lover Boy!"

Helen's Bells

There's not much you can do with the word "cupellation". It's pronounced "CUE-pellation", and to tell the truth we had lived a fairly normal life all these years without ever having an occasion to use it. A visitor sprang the word on us without any warning. "Metalworking," he sighed, "had a very romantic beginning. About 4000 years ago somebody in Troy cupellated silver from lead, and made some bells." Just like that. How would YOU like to have somebody throw "Cupellated" at you when you weren't looking? It inspired us to write:

In a town of Asia Minor
All along the Dardanelles
Lived a quite romantic miner,
And he yearned for silver bells.
He was something of a chemist,
And a metallurgist, too,
'Cause he wondered over metals:
In partic'lar, how they grew.
He had never heard of Helen,
And he never heard of Troy;
Why, he never heard of Paris,
That old Trojan lover boy.
Now, our chemist wasn't stupid;
He was blessed with useful ears,
But he antedated Helen
By a couple thousand years.
Though his fame is less than Priam's,
We salute this mighty Turk
For his metallurgic magic
And a splendid job of work.
So when Homer sang in couplets
Of the stirring days of Troy,
He chanted much of Helen,
But said nothing of our boy
Who cupellated silver
In the Trojan hills and dells:
That ancient metallurgist
Who gave us silver bells.

Shrdlu

(Metalworking Outlook—Page 31)

and Now—

BAKER TYPE FG STRAIGHT GAS

NOW— Baker has ALL THREE types of GAS FORK TRUCKS

● To its economy-priced, pneumatic-tired YARDLOADER and its premium GAS-O-MATIC line, Baker now adds the commercial version of its STRAIGHT-GAS fork truck—manufactured in quantity for the U. S. Armed Forces during the last two years. For ordinary fork truck applications this new Baker Type FG features low initial cost, low maintenance, speed and economy. It is built to the same high engineering standards that have characterized Baker electric trucks for over 35 years. Available in most wanted capacities.

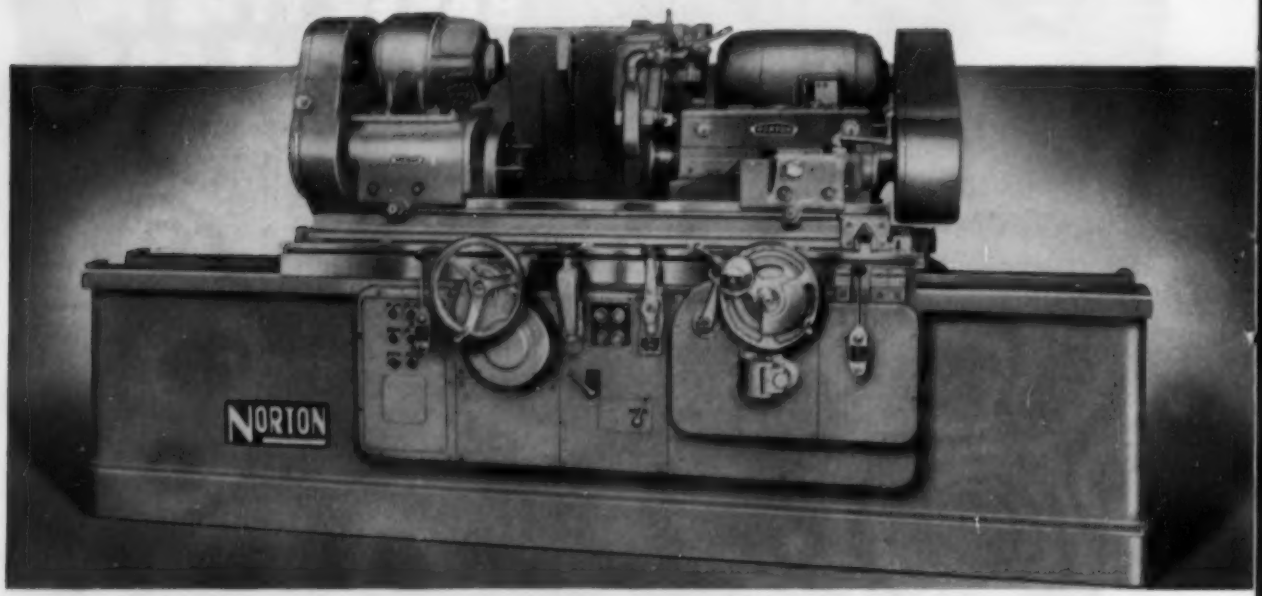
If you need a fork truck for rugged outdoor-indoor handling—on rough floor or ground conditions—or where long hauls are involved, you can save up to $1,000 initial cost by buying the speedy Baker EY-40 "YARDLOADER"—pneumatic-tired, heavy-duty, gas-powered—the lowest priced fork truck in the 2-ton class.

Outstanding gas truck in the Baker line is the GAS-O-MATIC. The gas engine drives the exclusive GAS-O-MATIC generator to supply power to the Baker electric motor—giving electric truck performance and operating economy at premium gas truck initial cost. Gas consumption for normal service of 2-ton model about ½ gallons per hour. Capacities 4,000 to 6,000 pounds.

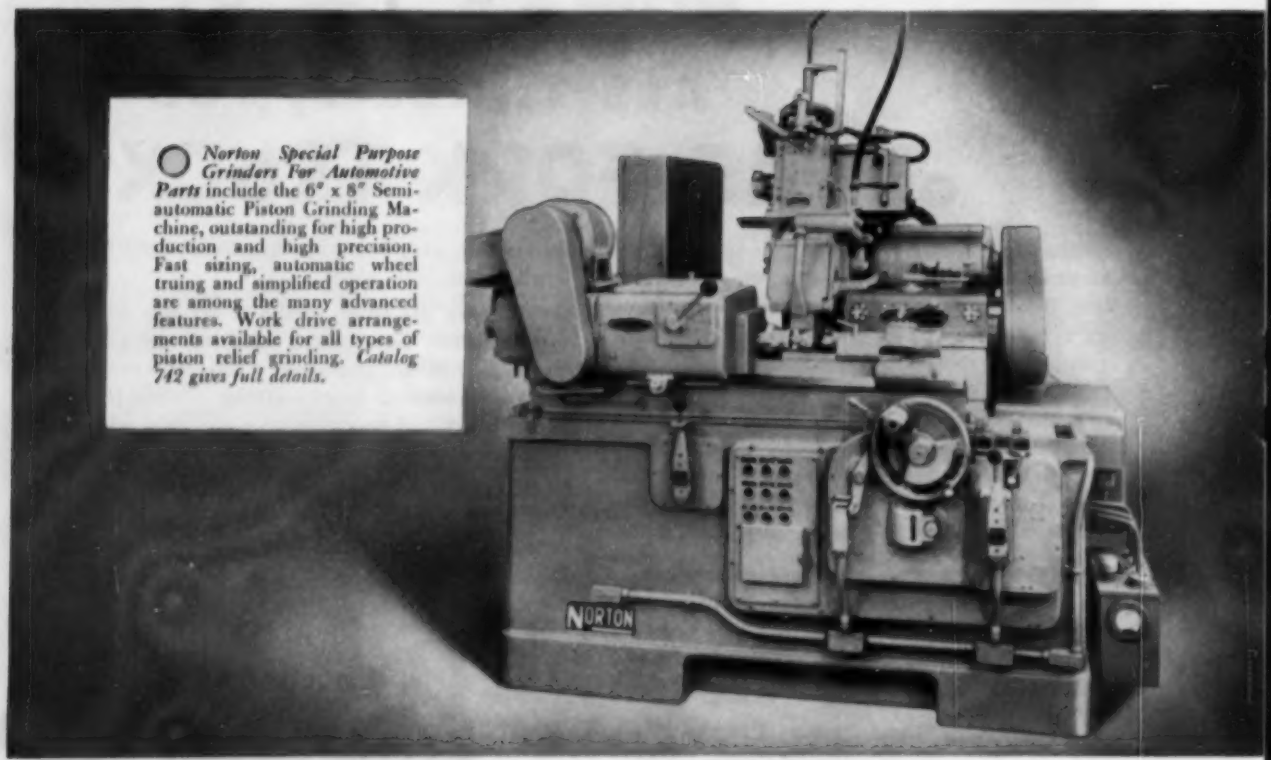
Descriptive bulletins are available. Write the Baker-Raulang Company, 1259 West 80th Street, Cleveland 2, Ohio.

Baker.
industrial trucks

6 from the world's most



Norton General Purpose Production Type Cylindrical Grinders. The 10" x 36" Type CTU Semi-automatic, a top performer among grinding machines of this type, offers a unique combination of speed, accuracy, flexibility and sturdiness. One-lever control of the automatic grinding cycle reduces operator's duties to loading and unloading. Production line and job shop users report Norton 10" CTU's have doubled production, replaced several machines, eliminated extra operations. *Write for Catalog 1787.*



Norton Special Purpose Grinders For Automotive Parts include the 6" x 8" Semi-automatic Piston Grinding Machine, outstanding for high production and high precision. Fast sizing, automatic wheel truing and simplified operation are among the many advanced features. Work drive arrangements available for all types of piston relief grinding. *Catalog 742 gives full details.*

complete line of

money-saving grinders and lappers

Norton Surface Grinders are well represented by this 8" x 24" Hydraulic Grinder. Designed with both hand and power table traverse and cross feed, it produces plane surfaces smoothly and speedily. Convenient controls and easy accessibility keep operating and maintenance times low. Extra equipment, such as magnetic chucks, wet grinding attachment and individual dust exhaust system meet all operating conditions. *Write for Catalog 190.*

Norton Tool Room Cutter Grinders. The No. 20 Cutter and Tool Grinder is the most versatile machine in its class. The wheel head tilts up to 15° above or below horizontal, and may be swivelled through 360° — simplifying such jobs as grinding taper reamers, step counterbores, form tools and milling cutters. Other pace-setting advantages include long table traverse and wheel slide travel . . . integral motor spindle . . . wheel slide graduated dials readable from any angle. No other cutter and tool grinder does so many jobs so fast, so easily. *Catalog 189 tells you why.*

Norton Lapping Machines. The Type 16FC Vertical Lapper brings you outstanding production capacity for such work as diesel injector parts, plug gages, size blocks, sides of small bearing races, pump gears and plates and many other parts. Laps flat work up to 3" x 5", and cylindrical work up to 3" diameter, producing a high degree of accuracy and finish. *Catalog 212 gives you details.*

Only Norton offers you such long experience in both grinding machines and wheels to help you produce more at lower cost.

The six machines shown here are typical products of that experience — bringing you ahead-of-the-parade design that speeds production and adds maximum product-value on every job they do for you.

But remember — these six advanced machines represent only a small fraction of the world's broadest line. Besides many models of cylindrical, surface, crankshaft and camshaft grinding machines, Norton produces a wide range of lapping machines, tool room grinders and special types for grinding pistons, valves, jet parts, etc.

A new illustrated folder #1843 lists the entire Norton line of grinding and lapping machines and tells you how to get all the facts on each unit. For your copy, write to NORTON COMPANY, Machine Division, Worcester 6, Mass. *In Canada:* J. H. Ryder Machinery Co., Ltd., Toronto 5.

Norton 16" Universal Grinders. The 10" x 20" Universal Grinder has the flexibility to handle an almost endless variety of jobs. Compound swivel arrangement of wheel head enables you to make separate angular settings of wheel and feed. External, internal, face or angular wheel slide operations are easy. Chuck may be mounted on one end of work head spindle, ready for use by turning head 180°. *Write for Catalog 170.*

To Economize, Modernize With NEW

NORTON

GRINDERS and LAPPERS

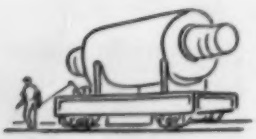
Making better products . . . to make other products better

District Sales Offices: Worcester • Hartford • New York
Cleveland • Chicago • Detroit

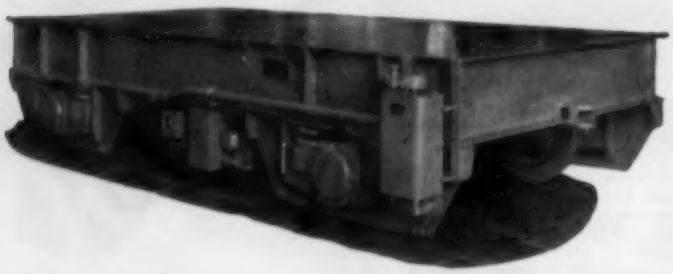
TRANSFER IT SAFELY

at Less Cost with

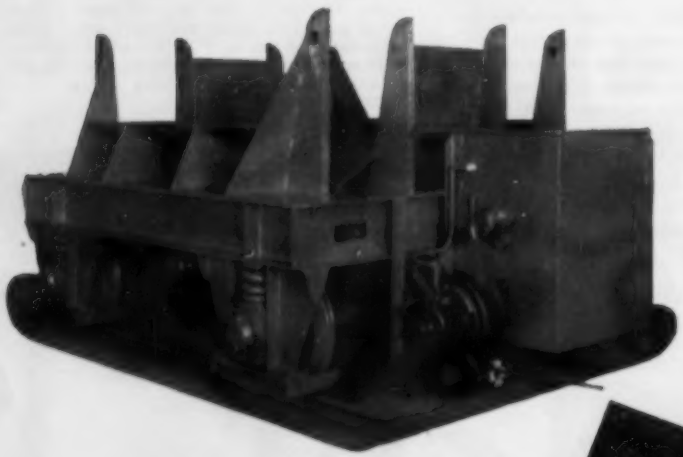
ATLAS



Atlas Safety-Type Transfer Cars are outstanding for moving heavy materials over short distances. Designed for storage battery, diesel or gas-electric, or cable reel service. Only one simplified control lever for safety. The car moves only when the operator holds the lever.



50-TON STORAGE BATTERY FLAT CAR



64-TON ELECTRIC FLAT CAR

Request "Walk-Along" Bulletin 1283

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

1140 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

LETTERS
TO THE EDITORS

New Look at Titanium

We would like to get 30 copies of your editorial, "For Titanium: New Horizons" (Dec. 27, p. 23). (America now has on tap a plentiful, lower-cost source for a most useful metal.)

We will distribute these tear sheets to our key men.

E. W. Van Den Bergh
Office of the President
American Pulley Co.
Philadelphia

• *Sent.—ED.*

Throwing Light on the Subject

I recall reading a forecast in "Metalworking Outlook" of improvements in lighting (Nov. 8, p. 37). I could not help but feel at that time that somebody had given you a faint clue of the development work which we were then doing on our new Cablematic lighting.

We are enclosing our first announcement brochure in which we thought you might be interested. ("Unlocking the fixture, and the subsequent lowering of the fixture, is accomplished by merely pulling down on the release lever . . .")

Wesley Wilson
Wil-Son Mfg. Co.
Cloverport, Ky.

• *Thank you for the information.—ED.*

Finding Steel Consumption

How did you arrive at 73 million net tons as the consumption of finished steel in the U.S. in 1954 as stated in the "Market Outlook" for Dec. 27, p. 85?

R. D. Woodward
Commercial Research Department
Bethlehem Steel Co.
Bethlehem, Pa.

• *We made the estimate on the expectation that mill shipments of finished steel in 1954 will total 64.2 million net tons. In arriving at that total we had shipment figures for the first 9 months of the year. Next, we calculated that close to 9 million net tons of finished steel were drawn out of inventory in 1954. Since we were in an inventory reduction year in 1954, we assumed that anything shipped from the mills was consumed. We added 64.2 million net tons and the 9 million net tons and reached a total of 73.2 million net tons that should equal consumption. We rounded that total and called it 73 million tons. Here is how we*

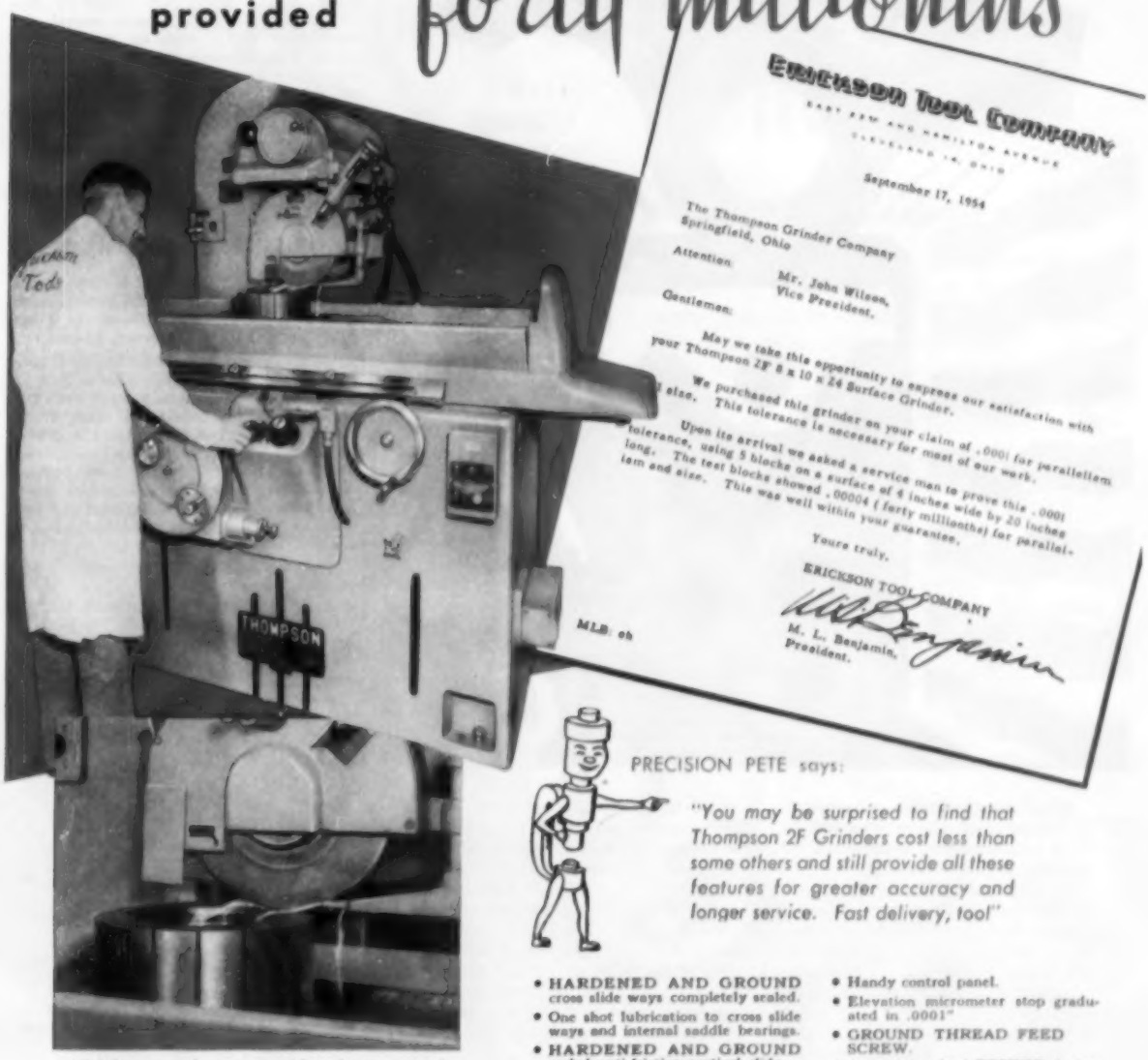
(Please turn to page 12)

The Erickson Tool Company

asked for at least .0001 for parallelism and size. . .

The Thompson 2F (8x10x24) Super Precision Grinder

provided "forty millionths"



ERICKSON TOOL COMPANY

EAST 83RD AND HAMILTON AVENUE

CLEVELAND 14, OHIO

September 17, 1954

The Thompson Grinder Company
Springfield, Ohio

Attention: Mr. John Wilson,
Vice President.

Gentlemen:

May we take this opportunity to express our satisfaction with your Thompson 2F 8 x 10 x 24 Surface Grinder.

We purchased this grinder on your claim of .0001 for parallelism [illegible] else. This tolerance is necessary for most of our work.

Upon its arrival we asked a service man to prove this .0001 tolerance, using 5 blocks on a surface of 4 inches wide by 20 inches long. The test blocks showed .00004 (forty millionths) for parallelism and size. This was well within your guarantee.

Yours truly,

ERICKSON TOOL COMPANY

M. L. Benjamin,
President.

MLB: ob

PRECISION PETE says:

"You may be surprised to find that Thompson 2F Grinders cost less than some others and still provide all these features for greater accuracy and longer service. Fast delivery, too!"

"Erickson products are sold and guaranteed to hold extreme accuracy. It is vital that we have the precision equipment necessary to manufacture these products. Our Thompson 2F Grinder delivers this precision. In the above picture we are grinding a #1200 expanding sleeve and hold within .0001 parallelism and size."

- **HARDENED AND GROUND** cross slide ways completely sealed.
- One shot lubrication to cross slide ways and internal saddle bearings.
- **HARDENED AND GROUND** sealed anti-friction vertical slide.
- **HARDENED AND GROUND BED WAYS** with automatic lubrication.
- 3600/1800 R.P.M. 2 speed wheel head. Heavy alloy steel spindle heat treated, runs in super precision ball bearings accurately preloaded, lifetime lubricated.
- Handy control panel.
- Elevation micrometer stop graduated in .0001"
- **GROUND THREAD FEED SCREW.**
- Automatic wheel TRUING device.
- Longitudinal hand feed with automatic engagement.
- Hydraulic head movement throttle with rapid traverse.
- Hydraulic table movement throttle.
- Elevating hand wheel graduated in .0005".

Call, write or wire for estimate

THE THOMPSON GRINDER COMPANY • SPRINGFIELD, OHIO

Thompson Grinders

PEARLITIC MALLEABLE CASTINGS

If service conditions are unusually rugged and you're troubled by high manufacturing costs—look to pearlitic malleable castings!

Pearlitic malleable has high fluidity that casts easily into complicated shapes. It resists wear under heavy loads at high speeds . . . has high ultimate strength . . . possesses excellent non-seizing properties for bearing surfaces . . . can be given a very smooth finish where desired . . . and can be either liquid quenched or air quenched. And perhaps *most important of all, pearlitic malleable machinability index ranges from 80 to 90* (B1112 steel = 100).

So look your product over critically. Then check pearlitic malleable castings. They can replace more expensive methods of fabrication or manufacture . . . can lead to reduced weight, less machining time . . . fewer assembly operations . . . *greater sales appeal for your product.* AA-108

NATIONAL
MALLEABLE AND STEEL
CASTINGS
COMPANY
Cleveland 6, Ohio

The Nation's largest independent producer of malleable and pearlitic malleable

LETTERS

(Concluded from page 10)

arrived at the 9-million-ton figure: We considered June, 1953, as a month in which mill shipments of finished steel were equal to consumption. Mill shipments that month were 6,950,059 net tons. We divided that figure by the Federal Reserve Board's index of metal fabricating. The June, 1953, index was 168 per cent of the 1947-1949 average. That computation showed that each point of the index was equal to 41,370 tons. Then, for each month we multiplied 41,370 tons by the month's index. Figures computed in this manner permitted us to calculate that reductions of finished steel inventories by consumers totaled 8,824,437 net tons in the first 10 months of 1954. We figured that most of the inventory reduction was completed in that period, and we rounded out the 8,824,437 total to 9 million.—ED.

Pearlitic Malleable Output

I am glad to have the tear sheets of my comment for STEEL's annual issue, Jan. 3, p. 229. The comment as it appears in STEEL is incorrect, however.

With regard to pearlitic malleable tonnage I wrote: "The 35,000 tons of pearlitic malleable which went into machine guns, tank rollers and other armament uses in 1944, saved over a double amount of steel, production equipment and man hours. In the past year, a decade later, with no substantial armament requirements, the peacetime production of pearlitic malleable has increased over 100 per cent."

The increase of 100 per cent in production was over that of a decade earlier, 1944. But your printed abstract reads, ". . . production of pearlitic malleable has increased 100 per cent over last year."

James H. Lansing
technical and research director
Malleable Founders' Society
Cleveland

Formula for Sales Figures

On p. 19 of the Dec. 27 issue, there was an estimate of $1250 million in sales for handling equipment in 1954. I wonder if you could inform me as to the source of this figure used in the "Metalworking Outlook" item.

John R. Andrews
Lionel D. Edie & Co. Inc.
New York

• *That figure is based on industry estimates and latest available figures from the Commerce department. The last figure from the latter source was $1,250,000,000 in sales for materials handling equipment in 1953.—ED.*

Test cuts eliminated

by accurate performance of CINCINNATI Shears...

The Buttons that save time. The great time-saver—the Cincinnati front controlled Power Back Gauge.

Brown-Wales Company says:

"As a steel warehouse, we have comparatively few production jobs, however, we have found that our men with this new shear can turn out far more work in an hour or a day than they could with the old one. In the first place, the power operated back gauge is a great time-saver when changing, as we frequently do, from one job to another.

"Secondly—the greater accuracy of the shear has made test cuts unnecessary, so that down time between runs is greatly reduced."

Write for Shear Catalog S-6.

Photos courtesy Brown-Wales Company, Cambridge, Mass.

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

5 brand-new

There's more than meets the eye in these new Cincinnatis . . . they're designed to give you additional opportunities to reduce metalworking costs in your shop. It will pay you to get the facts on the new Cincinnatis that fit your type of product. Write for literature . . . no obligation.

The Cincinnati Milling Machine Co., Cincinnati Grinders Incorporated, Cincinnati 9, Ohio.

New CINCINNATI FILMATIC No. 0 Centerless Grinder. It incorporates new ways to reduce setup time; new ideas in producing higher quality finish; more powerful. New specification catalog No. G-640 is yours for the asking.

New CINCINNATI HyPowermatic Milling Machine. Everything new, including Hydramech Table Drive with variable feed and backlash eliminator. 42 sizes, plain and duplex styles, up to 168" travel and 50 hp spindle drive. Do you want more information? Write for catalog No. M-1871.

New CINCINNATI FILMATIC No. 2 Centerless Grinder. It's easy to imagine costs going down with these new machines in your shop. They incorporate a host of exclusive cost-reducing features, including anti-friction infeed slide. You will find complete data in catalog No. G-644.

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New CINCINNATI No. 1 Toolmaster Milling Machine. A new member of the Cincinnati line. Gives you a new conception of rugged construction and maximum operator convenience for light milling operations. Desired by toolmakers everywhere. Catalog No. M-1870-1

New CINCINNATI No. 1 Cutter and Tool Grinder. A fitting companion for the famous CINCINNATI No. 2 Machine. Incorporates many new ideas and features of versatility for quickly and accurately sharpening cutters of all types. You'll want to know more about this one. Write for catalog No. M-1852.

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NEW IN PRODUCTS, PLANT, AND WAYS TO PERFORM METALWORKING OPERATIONS AT A LOWER COST

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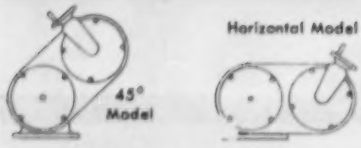
Motodrive



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5. New spiral groove lubrication.
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Production Pointers from GISHOLT

GISHOLT TIME-SAVING IDEAS

Presented as a service to production men, we hope some of these interesting ideas, chosen from thousands of jobs, will suggest ways to help you cut time and costs in your own work.

SHORT STROKES ON IDLE STATIONS PAY OFF WITH LONG SAVINGS

This Fastermatic Feature Saves both Cycle Time and Changeover Time

Here, the Gisholt 2F Fastermatic Automatic Turret Lathe is fully tooled for *both* machining operations on these steel gear forgings. For the first operation, tools on hexagon turret stations 1, 2, 4 and 5 are used. Tools on the front and rear cross slides face and chamfer.

When first operation machining on a lot is completed, tools already on hexagon turret stations 3 and 6 are ready for the second operation. This is possible because of the short stroke cam arrangement, a standard Fastermatic feature, which reduces travel of the hexagon turret saddle. This moves forward only far enough on idle stations to reset the indexing mechanism, saving 4.2 seconds per station.

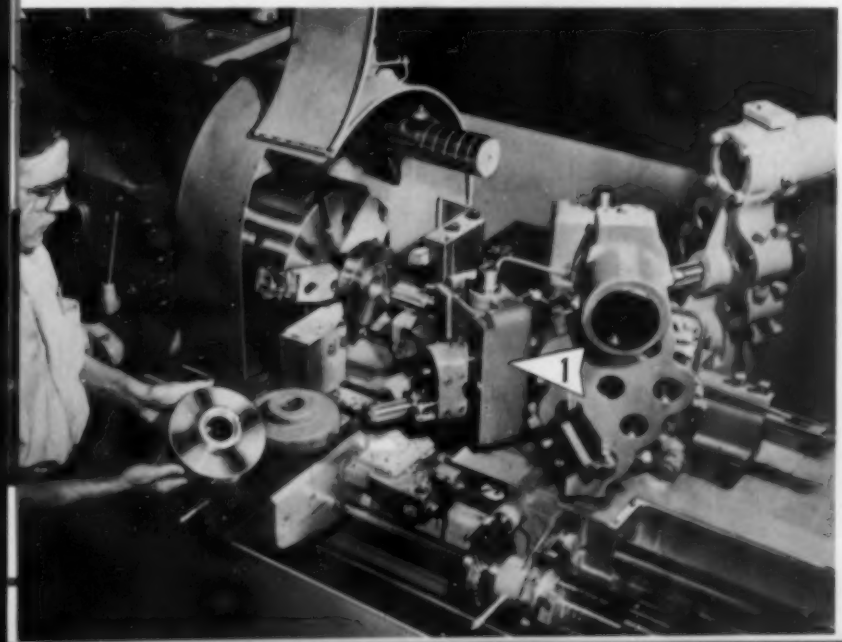
Changeover is a push-over

For the second operation, the short stroke cams operate on hexagon turret stations 1, 2, 4 and 5. Front and rear cross slide tools are changed. The chuck gets soft jaws which are bored and faced "in place" from hexagon turret station 6.

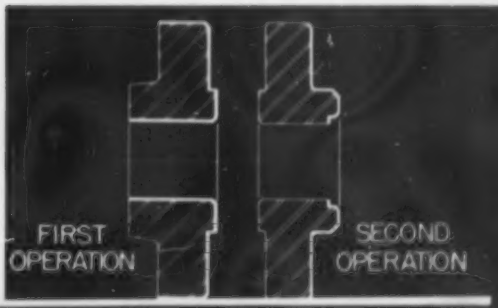
Tools on hexagon turret stations 3 and 6 and on the cross slides complete the part. Time for first operation is 3.30 minutes f.t.f., and for the second, only 1.39 minutes.

The standard short stroke arrangement reduces traverse time on all idle stations, and permits leaving second operation tooling in place on the hex turret for jobs like this.

1st operation setup. Operator holds second operation part. Adjustable boring head (1) bores and faces soft jaws "in place" and also chamfers co-bore in second operation.



To short stroke tooling on hexagon turret station facing the spindle, operating cam (2) is added. Cam is interchangeable and usable at any station.



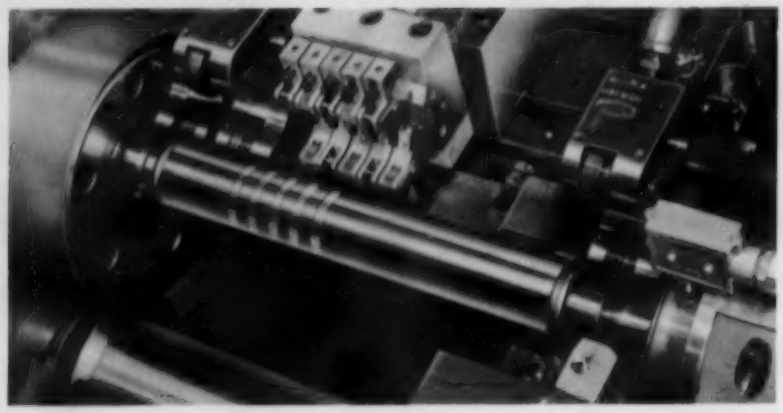
GISHOLT

TIME-SAVING IDEAS

15 SECONDS PER PART...INCLUDING THREADS

High Speed Setup for 6 sizes of grease gun barrels on Hydraulic Automatic Lathe

Setup for producing grease gun barrels shown above.



This is more than a problem of speed. Careful holding and driving are imperative. The material being worked is thin-wall welded sheet tubing.

Production is handled on this one Gisholt No. 12 Hydraulic Automatic Lathe. To avoid distorting, the parts are internally supported by bushings at both ends for forming and threading. A tailstock-supported expanding mandrel drives and also equalizes chucking pressure and supports where knurling is done.

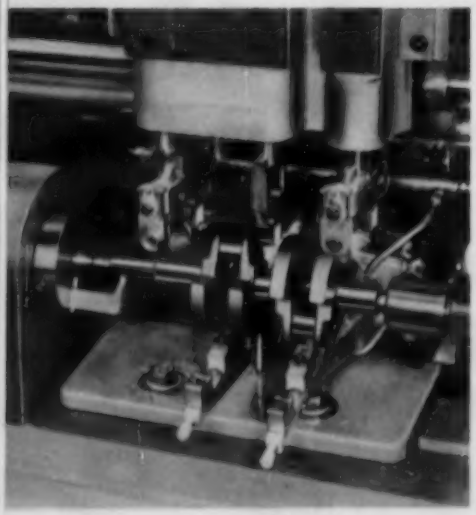
Tools on the front carriage turn the right end and form an oil seal. Tools on the rear independent slide roll the threads at both ends and perform knurling. Because knurling is done on the four larger sizes only, the knurling tool block flips back out of the way for the other two sizes.

Production is at a rate of 192 parts per hour at 80% efficiency. Workpieces range from 5" to 15" in length.

The simpler loading and faster machining provided by the No. 12 Automatic Lathe make it possible to produce 4 parts per minute.

60% MORE PRODUCTION WITH 2-IN-1 SUPERFINISHING

Crankshaft main & pin bearings Superfinished at once



All bearing surfaces are Superfinished at once with this double-tooled Superfinisher. All crankshafts shown at right are done on this one machine.

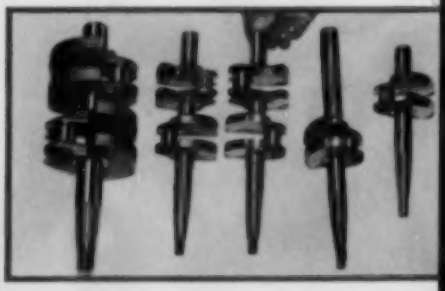
By keeping abreast of new developments, West Bend Aluminum Company, Hartford, Wisconsin, now Superfinishes outboard motor crankshafts 60% faster than before. This Gisholt Model 51A Superfinisher is tooled to Superfinish simultaneously both main and pin bearings on a variety of crankshafts.

With the workpiece loaded, the operator attaches follower-type stoneholder arms to the pin bearings. Pressing a button starts the cycle.

Two, three or four stone-carrying quills Superfinish the main bearing surfaces while the follower-type stoneholder arms do the pin bearings.

Time is only 35 seconds f.t.f. and bearing surfaces are Superfinished from 30 to 40 micro-inches down to 10 to 15 micro-inches RMS. This *controlled* 10 to 15 micro-inch "frosty" finish holds oil and eliminates the need for "breaking in" bearing surfaces. Grinding marks are removed and all amorphous smear metal scrubbed away.

In this interesting setup, both main and pin bearings are Superfinished in one operation, thus saving time and money to produce a product that performs better, lasts longer.



Superfinish has made great strides in the past few years. This and many other interesting jobs are shown in the new Superfinish catalog, form No. 1169. Write for your copy.

GISHOLT

TIME-SAVING IDEAS

HOW TO MACHINE CAST IRON AND STEEL AT SAME TIME

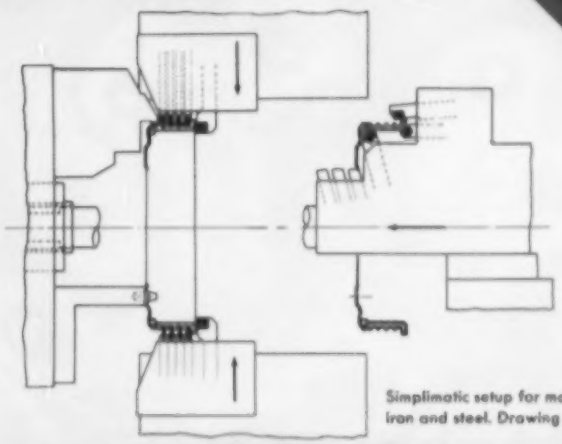
Brake drums handled fast on Simplimatic Automatic Lathe

The workpieces here are brake drums with heavy outer rims of cast iron and stamped back plates of steel. Job requirements are: (1) To do simultaneous machining of two materials, (2) produce a good finish, and (3) complete all work in one chucking.

A Simplimatic Automatic Lathe machines the drums, which are 10″ in diameter and 2⅜″ deep. Chucked on the O.D., wide swivel jaws prevent workpiece distortion. Location is against the back face and drive is through a hole in the steel web.

Carbide-tipped tools on the front and rear slides rough and finish groove and face, while tools on the center slide bore the I.D., chamfer and turn the O.D. of the cast iron rim. At the same time, three high-speed steel tools on the center slide, rough, semi-finish and finish bore the steel back plate. Three tools divide the cut and prevent flaring out of the edges around the bore.

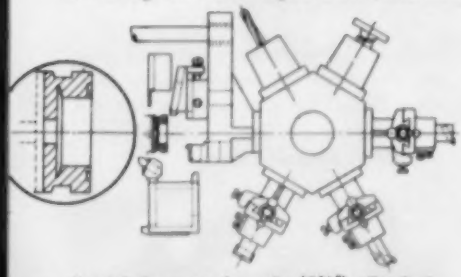
Expert tooling, smart holding and automatic production combine to give a low 1.7 minute f.t.f. time for machining these difficult two-metal parts.



Simplimatic setup for machining drums of cast iron and steel. Drawing shows tooling layout.

SINGLE CHUCKING GUARANTEES ACCURACY OF SPLIT PARTS

Variety of workpieces handled by one Ram Type Lathe



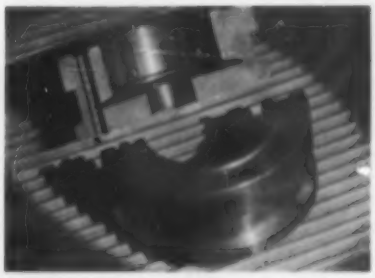
▼ Special air-operated oversize (5¾″) collet chuck is supported in steadyrest.

These cast iron neck-ring molds are made from stick castings which are split and ground before coming to this machine. To be certain of parallel faces and concentricity, it is important to hold to one chucking.

Here is how it's done on this Gisholt No. 5 Ram Type Turret Lathe: Standard tools on the hexagon turret core drill, co-bore and recess in the cavity, finish turn the O.D., face and groove. Square turret tools rough turn and face, form and groove. Cutoff is from the rear tool post using reverse feed on the cross slide.

Because stick castings are 16″ in length, a ball bearing steadyrest supports the work during all machining operations. Time ranges from 5 to 7 minutes f.t.f.

Parallel faces and concentricity of these divided parts are insured by completing all machining in one handling on a Gisholt Ram Type Turret Lathe.



Completed neck ring for bottle mold.

"What You Should Know About Buying and Renting Machine Tools"

This new bulletin reviews the most current and up-to-date thinking on leasing and time payment plans. Ask for your free copy of P-1173. No obligation, of course.

GISHOLT

TIME-SAVING IDEAS

CORRECTIVE MACHINING CUTS DOWN 155 MM SHELL LOSSES

Gisholt 2L Saddle Type Turret Lathe Performs Money-Saving Service

Shell production is big production. Slips are bound to occur along the line sometimes. The job of this 2L Saddle Type Turret Lathe is to make good shells out of bad ones by performing these five corrective machining operations:

Operation 1 Nose end. Face from square turret, bore and co-bore from hexagon turret.

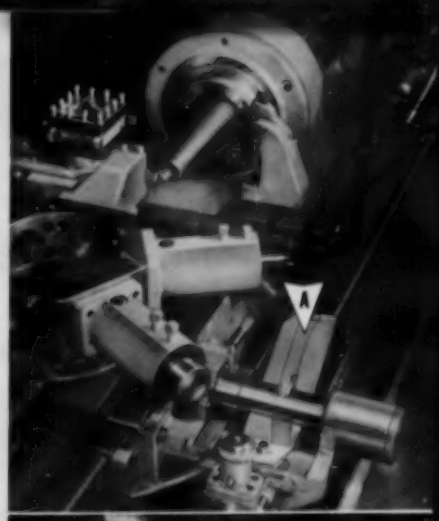
Operation 2 Ogive. Locate from nose end and turn ogive with special tool on hexagon turret governed by special taper attachment cam plate (see A).

Operation 3 Base end and boattail. Face from square turret and turn boattail with square turret tool governed by special taper attachment cam plate.

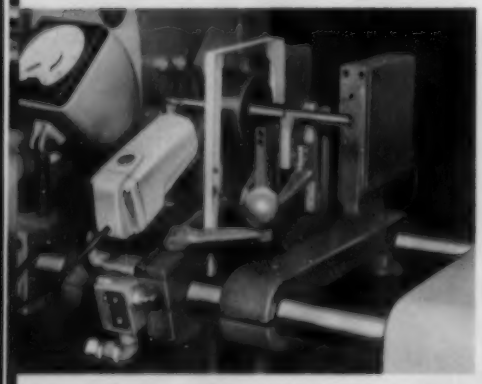
Operation 4 Band groove. Machine band groove with special tool in tool holder at rear of bridge-type cross slide (see B).

Operation 5 Form band. A special form tool in tool holder at rear of bridge-type cross slide forms band.

This standard saddle type lathe equipped with cross-feeding hexagon turret and bridge-type cross slide meets all shell salvage requirements.



AND NOW, STILL MORE SPEED IN PRODUCTION BALANCING



Lever raises or lowers work-driving belt and starts or stops Balancer for simpler, faster loading.

Loading and Starting of Balancer Made Faster by Double-working Attachment

These armatures are dynamically balanced to low tolerances on a Gisholt 1S DYNETRIC Balancing Machine at a very rapid pace. Yet, a further step-up in speed has been made by the use of a belt lifter attachment.

One easy movement of the hand lever raises the work-driving belt to clear the work or bearings for loading and unloading, and at the same time actuates a micro switch to start or stop the machine drive motor. This simple device pays off very well.

This belt lifter attachment combines with the direct-reading amount meter and other Gisholt Balancer features to attain even higher production speeds for accurately balanced parts.

Balancing School, the only one of its kind, is offered by Gisholt. Covers all phases of this important subject. Write for complete details.

DYNETRIC BALANCERS

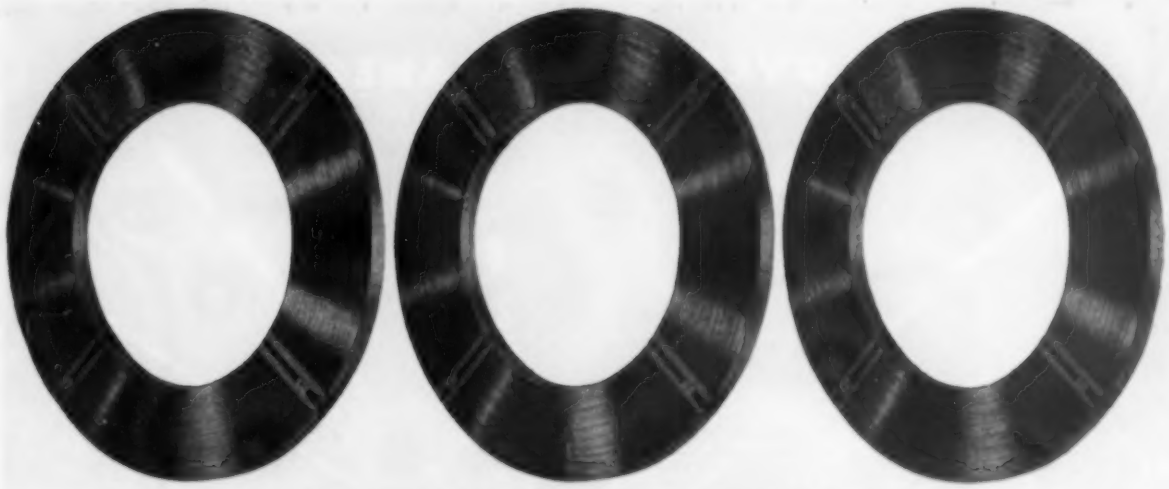
No. 1-255

634

THE GISHOLT ROUND TABLE represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

GISHOLT MACHINE COMPANY Madison 10, Wisconsin

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES



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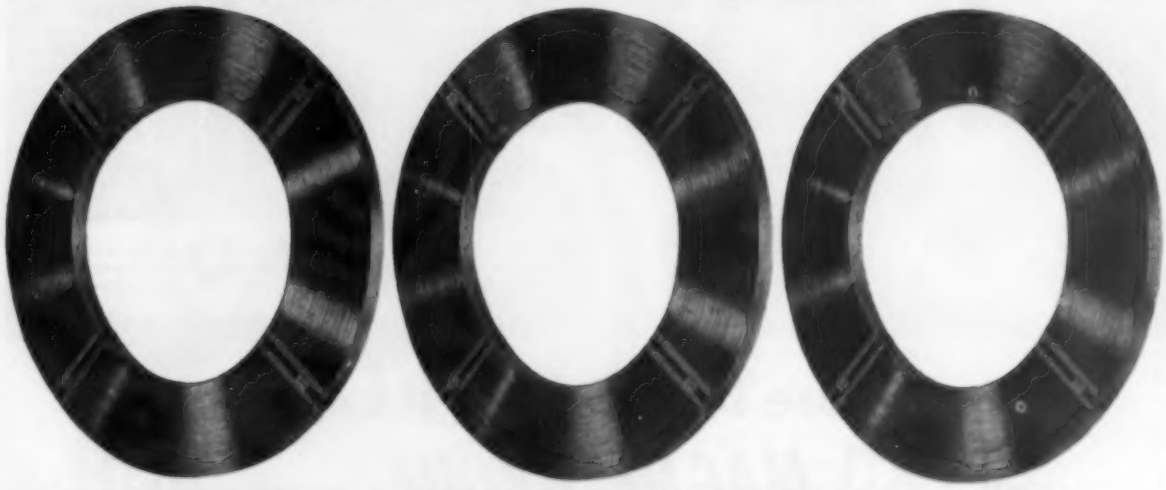

full range of COLD ROLLED specialty steels

Look to Crucible for highest quality cold rolled specialty steels. You'll find a wide assortment of alloy strip and carbon spring steels . . . in many analyses, sizes, shapes and finishes.

Crucible, the nation's leading producer of *special purpose steels*, controls steel production from ore to finished product. And special Crucible-patented machines bring you cold rolled steels with *finer* finish . . . better edges . . . closer than standard tolerances.

When you have a cold rolled specialty steel application, call Crucible in during the *planning* stage. Crucible engineers can help you develop the specification . . . and knowing the end use for the steel, will prescription-make it to suit your needs—in coils or cut to your particular length requirements. *Crucible Steel Company of America, Henry W. Oliver Building, Pittsburgh 30, Pa.*

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

P&H OVERHEAD CRANES

Here, in the Peoria plant of the Caterpillar Tractor Co., is one of their 11 new P&H Cranes with Magnetorque AC control. Caterpillar owns more than 100 P&H Overhead Cranes.

Eleven more for CATERPILLAR

...all P&H MAGNETORQUE® equipped!

The big demand is for Magnetorque! Old customers, new customers — *everybody* prefers Magnetorque. Here's why:

Management likes it better because it offers tops in crane performance with the convenience and economy of AC power.

Operators like it better because it's so much easier to use . . . because it makes *any* operator a *star* operator. It's simpler, smoother, more accurate — the finest crane control ever devised.

And naturally, *we* like it because every Magnetorque-equipped crane we sell makes more friends for P&H. Through 7 years and over 900 new installations we've had no failures. Service problems are fewer than ever. Magnetorque lasts the life of the crane.

If you contemplate crane installations, see P&H. You'll quickly see why so many leading companies standardize on P&H.

NEW! Just off the press — a brand-new bulletin with full information about Magnetorque Control. Includes comparative speed-load curves, etc. Ask for Bulletin C-30.

P&H OVERHEAD CRANE DIVISION

HARNISCHFEGER CORPORATION

MILWAUKEE 46, WISCONSIN

DISSTON
HAS THE EDGE®

Ask for Disston Super-Safe Hack Saw Blades

and blades that hold it!

to give you faster, straighter power hack sawing

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CALENDAR
OF MEETINGS

January 18-20, Caster & Floor Truck Manufacturers Association: Annual meeting, New Weston hotel, New York. Association address: 27 E. Monroe St., Chicago 3. Executive secretary: Harry P. Dolan.

January 18-20, National Industrial Conference Board Inc.: General session for all associates, Hotel Astor, New York. Board address: 247 Park Ave., New York 17. Secretary: Herbert S. Briggs.

January 19-20, Steel Shipping Container Institute Inc.: Winter meeting, Hampshire House, New York. Institute address: 600 Fifth Ave., New York 20. Secretary: L. B. Miller.

January 20-21, Radio-Electronics-Television Manufacturers Association: Symposium on printed circuits, University of Pennsylvania, Philadelphia. Association address: 777 14th St. N.W., Washington 5. Secretary: James D. Secrest.

January 20-21, Steel Plate Fabricators Association: Annual meeting, Palmer House, Chicago. Association address: 79 W. Monroe St., Chicago. Executive director: J. Dwight Evans.

January 21, Engineers Joint Council: General assembly, Hotel Statler, New York. Council address: 29 W. 39th St., New York 18. Secretary: Stewart E. Reimel.

January 21, Malleable Founders' Society: Semi-annual meeting, Hotel Cleveland, Cleveland. Society address: 1800 Union Commerce Bldg., Cleveland 14. Managing director: Lowell D. Ryan.

January 23-27, Associated Equipment Distributors: Annual meeting, Conrad Hilton hotel, Chicago. Association address: 30 E. Cedar St., Chicago. Secretary: P. D. Hermann.

January 24-25, Industrial Heating Equipment Association Inc.: Annual meeting, Sheraton-Cadillac, Detroit. Association address: 412 Fifth St., N.W., Washington. Secretary: T. F. Sheckels.

January 24-27, American Management Association: General management conference, Statler hotel, Los Angeles. Association address: 330 W. 42nd St., New York 36. Vice president-secretary: James O. Rice.

January 24-27, Plant Maintenance & Engineering Show: International Amphitheatre, Chicago. Information: Clapp & Poliak Inc., 341 Madison Ave., New York 17.

January 24-28, International Heating & Ventilating Exposition: Commercial Museum and Convention Hall, Philadelphia. Information: International Exposition Co., 480 Lexington Ave., New York 17. Manager E. K. Stevens.

January 25, Mining & Metallurgical Society of America: Annual meeting, Mining Club, New York. Society address: 11 Broadway, New York 4. Secretary: Lt. Col. Donald M. Liddell.

January 27, American Coke & Coal Chemicals Institute: Regional meeting, Drake hotel, Chicago. Institute address: 711—14th St., N.W., Washington 5. President: Samuel Weiss.

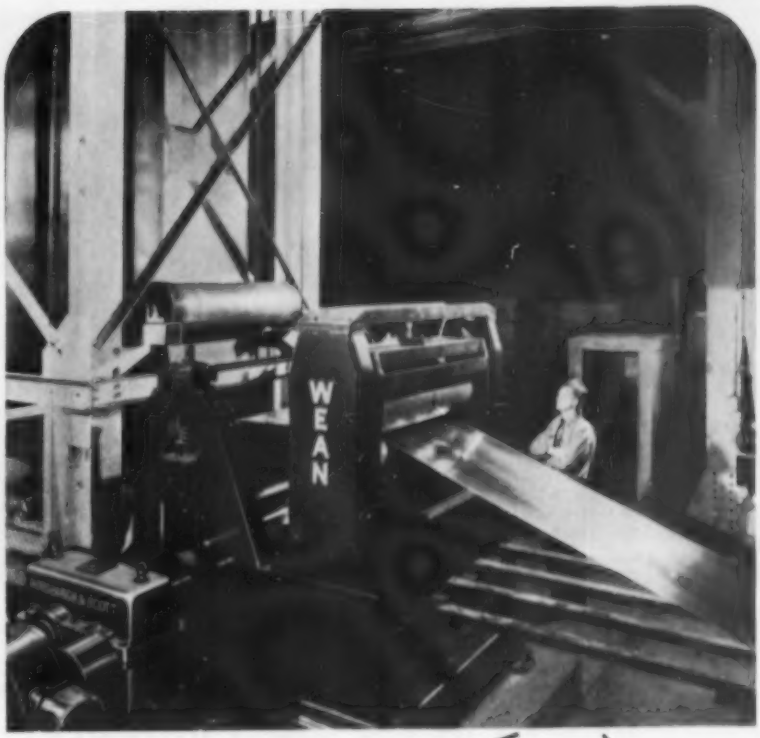
January 27-29, Truck-Trailer Manufacturers Association Inc.: Annual convention, Boca Raton hotel and club, Boca Raton, Fla. Association address: 710 Albee Bldg., Washington 5. Managing director: John B. Hulse.

January 31-February 4, American Institute of Electrical Engineers: Winter general meeting, Statler hotel, New York. Institute address: 33 W. 39th St., New York 18. Secretary: N. S. Hibshman.

January 31-February 4, American Society for Testing Materials: Spring committee week, Netherland-Plaza hotel, Cincinnati. Society address: 1916 Race St., Philadelphia 3. Executive secretary: Robert J. Painter.

February 3, Cutting Tool Manufacturers Association: Annual meeting, Detroit Yacht Club, Detroit. Association address: 415 Penobscot Bldg., Detroit. Secretary: Martin J. Ewald.

February 6-11, American Society of Civil Engineers: Annual meeting, U. S. Grant hotel, San Diego, Calif. Society address: 33 W. 39th St., New York 18. Secretary: Col. Wm. N. Carey.



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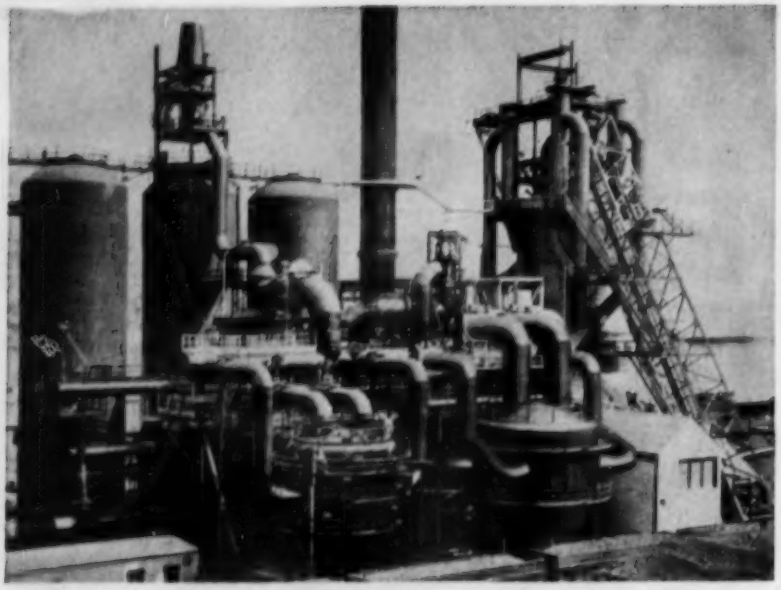


How Cottrell Precipitators Clean Gas in the Steel Industry

Iron Ore Sintering Plants

The first commercial Cottrell installation for cleaning gases coming from the iron ore sintering machines, shown above, was placed in operation in 1952 with collection efficiencies exceeding 95%. In this installation the gases leaving the windboxes of the sintering machine pass to a flue, then to a mechanical collector, to the induced draft fans, to the precipitator, and then to stack. The gases enter the precipitator at temperatures of about 250 to 300F, with water vapor content of about 8%. The dust collected is dry and quite fine. The precipitators used on this application are of the horizontal steel plate type.

Iron Blast Furnaces

The cleaning plant in most iron blast furnace installations consists of the preliminary stage (dry dust catchers), the primary stage (water scrubbers) and the secondary stage (water-flushed Cottrell Precipitators). Dust and fume content of the gas is reduced to the range of 0.1 to 0.3 grains per cubic foot of gas corrected to standard conditions before it reaches the Electrical Precipitator. The function of the precipitator is to further clean this gas to a final dust content ranging in most cases from 0.005 to 0.01 grains per cubic foot, depending on how the gas is to be used.

Open Hearths

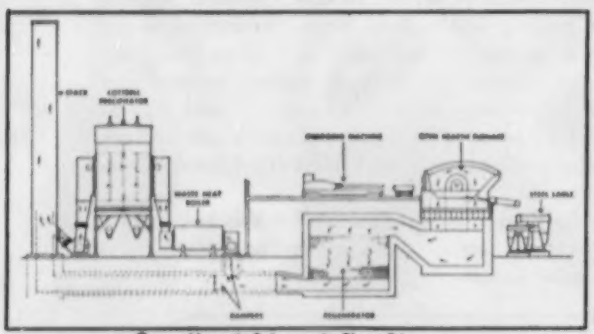
This problem involves the cleaning of combustion gases coming from furnaces, usually oil-fired, and carrying in suspension a heterogeneous mixture of very fine metallic oxides.

After extensive research and pilot plant studies, Research-Cottrell completed the first commercial precipitator installation for cleaning open hearth gases in 1951. Test results at rating indicated efficiencies of over 95% were obtained. Most of the time there was no visible discharge.

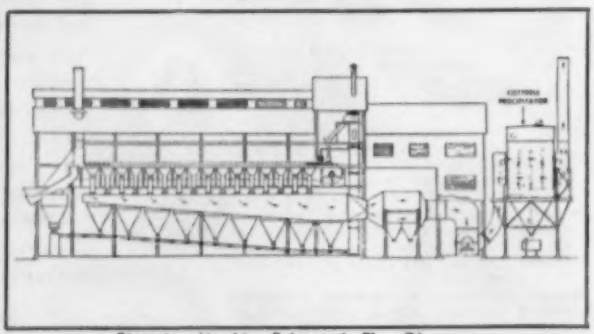
Other Steel Applications

In addition to the above, Research-Cottrell installations are being used for detarring by-product coke oven gas, cleaning oven fuel gas and producer gas, and cleaning ferro-manganese blast furnace gas.

Detailed information on all these applications is available through your nearest Research-Cottrell office.



Open Hearth Schematic Flow Diagram



Sintering Machine Schematic Flow Diagram

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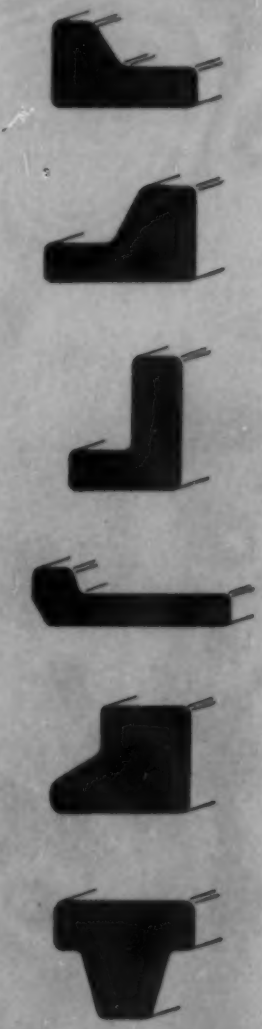

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STEEL
January 17, 1955

Metalworking Outlook

A Conservative $500 Billion

President Eisenhower's prediction of a $500-billion gross national product by 1965 is conservative, not radical. It will mean about a 40-per-cent boost from the 1954 level of $356.6 billion. From 1945 to 1954, GNP climbed 67 per cent. To achieve the 1965 target, an annual improvement of less than 4 per cent will be all that's needed.

CIO, AFL See Eye-to-Eye

Still skeptical about CIO-AFL merger chances? Then, take a look at where the two stand on major national issues. They both want a unified national system of unemployment compensation, extended social security coverage, a national health program, an increase in the personal income tax exemption, more public housing and federal aid to housing, a $1.25 minimum wage, repeal of right-to-work laws, a shorter work week and amendments to Taft-Hartley. The only national issue on which they differ is the guaranteed annual wage. And even there the divergence is not serious. The CIO wants GAW. AFL says it has no position.

The Urge To Merge

What's behind metalworking's urge to merge? The major motive is a search for capital, says Walter W. Weismann, Aetna Industrial Corp.'s chairman. "With a minimum of risk capital available," he says, the going has become too difficult for any but the heavily entrenched companies, with the result that merger or acquisition becomes the only method by which the more vulnerable business operation can acquire the necessary capital to effect greater productivity, lower operating costs and an improved competitive position." He thinks that the trend will continue and that we need a more realistic appraisal of what constitutes "big business."

A Tax Roadblock

The tax structure is one major roadblock to raising capital. The kind of capital that gives a company the greatest flexibility is equity (raised through selling stock). Even though the 1954 tax law gave slight relief, dividend funds are taxable in the hands of the corporation, and most of them are taxable a second time in the hands of the stockholder or investor. That's why industry in 1953 financed only $2.4 billion of its $22-billion capital requirements through sale of equities. That situation makes more noteworthy General Motors Corp.'s decision to raise $325 million through sale of common stock, the largest piece of financing of that type ever undertaken by any corporation.

Follansbee's Future

The future of the steelmaking plant in Follansbee, W. Va., lies in specialty production, believes Cyrus Eaton, one of the new owners. He thinks it

Technical Outlook—71 Market Outlook—p. 111

can make money on such products as special strip and sheets. Mr. Eaton also says that raw materials from Portsmouth Steel Division of Detroit Steel Co., another firm in which he has an interest, would be used if necessary to support Follansbee's bid for business.

Iron Vs. Ingot Expansion

Take a look at the new ingot and pig iron capacities. They dispel an impression, particularly among scrap men, that the steel industry has expanded more in pig iron than in ingot capacity. That's of concern to scrap dealers because pig iron is the competing metallic with scrap. As of Jan. 1 this year, iron capacity was an estimated 83.5 million tons, ingot potential 125 million tons. Blast furnace capacity is 67 per cent of ingot capacity, compared to a 72-per-cent ratio five years ago, a 70-per-cent ratio a decade ago.

More Building Equipment in '55

Sales of new construction machinery will rise in 1955 from 1954. Last year's volume slipped below 1953 levels even though building last year surpassed the 1953 performance. Over the next 12 months, equipment buying will come back in line with the general construction picture. But prospects for used machinery are bleak, says Associated Equipment Distributors, and the volume will drop below indifferent 1954 levels. One reason: The new tax depreciation provisions are unfavorable to buyers of used equipment.

Home Laundry: $1-Billion Market

Home laundry equipment makers sold nearly 5-million washers, dryers and ironers for an estimated $1 billion in 1954. The outlook for 1955 is a 5 to 10 per cent improvement in the number of units sold, although dollar volume probably won't rise quite so much. As recently as 1940, the industry had total sales of only $100 million.

Straws in the Wind

Year-round air conditioning will be a feature in 25 to 30 per cent of new homes selling for $15,000 in 1955, predicts Union Asbestos & Rubber Co. . . . Flxible Co. foresees 1955 city and intercity bus sales up 10 per cent over 1954's, from 3656 last year to 4500 in the next 12 months . . . Westinghouse Electric Corp. has fired five "undesirable employees" who have been accused in sworn testimony of Communist party activities . . . GM's $1-billion expansion is now about 60 per cent completed.

This Week in Metalworking

Metalworking expansion continues (p. 37) . . . Of the 100 largest corporations in the U.S., 46 are in metalworking (p. 39) . . . High construction activity opens metal door and sash prospects (p. 40) . . . Scrap business will improve in 1955 (p. 41) . . . The Committee for Economic Development attacks the U.S. method of budgeting (p. 45) . . . Machinery prices have risen 33 per cent less than wages since 1939 (p. 50).

What's New in Steel Service

Again in 1955, as in every year since 1842, Ryerson is setting the steel-service pace. Many advances in our ability to serve you have been made in recent months—many more are immediately ahead. Briefly, here is what you can expect:

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NEW QUALITY SAFEGUARDS—Steel you order from Ryerson now protected by a whole new set of quality control standards—tighter than any thought possible before. As evidence of uniform high quality we can furnish a certificate of analysis or a mechanical properties report for every pound of steel we ship.

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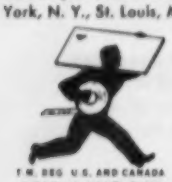

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The demand for sheet, strip and manufacturers' wire is continuing to put pressure on our schedules. That's why pulling "next week" deliveries out of our hip pockets is not so easy now. As against that we'll do everything our schedules permit to accommodate your more urgent needs.

What it means is that requirements should be anticipated a little further ahead and that delivery promises have to be realistic.

Here's Where We Stand on Delivery Promises

We will not knowingly overbook orders. We never go on the hope that we'll be able to take care of everybody, somehow or other, by hook or by crook.

We won't pyramid promises. That kind of policy can only lead to robbing Peter to pay Paul, and in the long run satisfies no one.

We won't agree to meet delivery requests unless we are reasonably sure we can. We would rather lose your order than chance disappointing you later.

We may sometimes hold back from committing ourselves to the delivery you name. 'Most always, however, we'll make the delivery we promise.

We're not implying that we never, never slip. We are saying that we won't make promises lightly—for your sake as well as our own.

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Motivation and Morale

Under the pressure of running a business, management too often forgets that motivating and building morale in its people is one of the most important avenues to success.

Overlooked are two basic facts: That most people use only a minor fraction of their potential; that it is possible to develop real zeal in almost everyone. Both go to human traits which cannot be handled through welfare plans, paternalism, fringe benefits and recreation programs.

Ralph M. Besse, executive vice president, Cleveland Electric Illuminating Co., told a management group last week that the job is one for the company president. If motivation and morale do not start at the top, they do not start.

It's his responsibility, he says, to see to it that the whole organization is inspired to achieve maximum service, productivity and profit.

Psychological requirements for the job indicate the president should:

1. Provide recognition for achievement through himself, managers and supervisors.
2. Promote the employee's pride in his job, his product and his company.
3. Make sure every employee has and *believes* he has opportunity.
4. Provide competition among individuals and among organizational groups.
5. Establish a pay system that is objective in principle and application; that includes incentives where practical.
6. Build a reputation for fair and equitable treatment that includes supervisory interest in personal human problems.

Setting up a motivation program takes a lot of work and planning. Each person reporting to the president requires individual study. Performance goals and standards need to be set up. Contact is necessary to see how the individual is doing. He must be delegated authority and responsibility. He should be in on policy making. Finally, the president should set a performance example himself.

In morale building, a president must develop character in his institution and see that employees are reminded of it from time to time. Those who report to the president can be coached to do some motivating down the line. Through proper training and procedures, people can improve their jobs.

Good management can result in good employee motivation and morale. Conversely, the techniques used in attaining good employee motivation and morale can result in good management.

Irwin H. Such

EDITOR

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SPENDING ON NEW PLANT AND EQUIPMENT

(in millions)

	1st Q 1953	1st Q 1954	1st Q 1955
Durable Goods Industries	$1331	$1224	$1149
Primary Iron & Steel	326	210	182
Primary Nonferrous Metals	112	77	58
Electrical Machinery & Equipment	88	94	97
Machinery, Except Electrical	183	162	162
Transportation Equipment	230	322	328
Stone, Clay and Glass Products	75	75	79
Other Durable Goods	317	283	236

Source: Securities & Exchange Commission and Commerce department.

Another Busy Year for Capital Investment

There are many reasons why purchases of new plant and equipment by metalworking firms will continue heavy into 1955. But competition is the prime one

METALWORKING plans heavy capital expenditures in 1955.

Early estimates show the overall dollar volume, though down from 1954's, will be high. Durable goods manufacturers plan to reduce new plant and equipment purchases 6.1 per cent to $1149 million in the first quarter, 1955, compared with $1224 million in the first quarter, 1954 (see table). That's a bigger reduction than planned by U.S. business as a whole over the same period (2.1 per cent), but it's still a sign for optimism.

Habit—Metalworking traditionally buys light in the first quarter of the year, heavier in the latter half. So on a seasonally adjusted basis the first quarter of 1955 stacks up against the corresponding quarter of 1954 like this: Durable goods manufacturers are cutting capital spending only 0.9 per cent, compared with 2.1 per cent for U.S. business as a whole.

Further, some segments of metalworking, notably machinery and transportation-equipment producers, plan to spend more money on new plants and equipment in first quarter, 1955, than in first quarter, 1954.

Bargains—Basically, metalworking must continue to spend for plant and equipment to stay up with the competitive march. A recent study by the Machinery & Allied Products Institute shows machinery to be one of the bargain buys for metalworking (p. 50). The MAPI study indicates machinery prices have increased 33 per cent less than wages since 1939.

Below are some of the many expansions and acquisitions presently in the metalworking news. They illustrate the fact there is still plenty of steam behind the expand-to-stay-competitive drive in metalworking.

Koppers Co. Inc. plans to spend $20 million in 1955 on new plants and equipment, one of the biggest capital-spending years since World War II for Koppers. Already announced: F. X. Hooper Co., Glen Arm, Md., has been purchased to operate as a part of Koppers' Metal Products Division. Hooper Co. makes machinery used by the corrugated-shipping-container industry.

Aluminum Co. of America will spend $5 million for additions to aluminum rolling equipment at its Davenport, Iowa, works. A new, 100-in. cold mill, part of this program, is expected to be in operation by early 1956.

Kaiser Steel Corp. will build a $1,150,000 structural-steel building to add to its mill warehousing facilities at Fontana, Calif.

Kaiser Aluminum & Chemical Corp. has about completed a 310,000-sq ft addition to house two 8000-ton extrusion presses at Halethorpe, Md.

Cleveland-Cliffs Iron Co., Cleveland, awarded the contract for construction of an agglomerating plant at its Republic mine near Marquette, Mich., to McDowell Co.

Westinghouse Electric Corp.

says it will build a jet engine research and development facility, costing more than $12.5 million, at its plant south of Kansas City, Mo.

Fielden Instrument Division (it makes electronic control devices and industrial instrumentation) of Robertshaw-Fulton Controls Co., Greensburg, Pa., expanded its plant and office facilities threefold in Philadelphia.

Crown Cork & Seal Co., Crown Can Division, plans to start work soon on a 123,000-sq ft can-making plant, to be completed before the end of 1955.

Caldwell Casting Co. Inc., Baltimore, is installing equipment which will materially increase production of small nonferrous castings and high-pressure injection-molded die castings.

Alcaloy Inc. is planning further expansion in Trenton, N. J. The company has already bought land and buildings at Schenk and W. 3rd Sts. in Trenton from Republic Steel Corp. for this purpose.

Bullard Co. has awarded the general contract for construction of its new foundry to Edwin Moss & Son Inc. The new foundry in Bridgeport, Conn., will cost about $6 million.

Atlas Chain & Mfg. Co. will put up a new $75,000 plant for the manufacture of roller chains and sprockets in Colmar, Pa.

Hubbard & Co., one of the largest manufacturers of pole line hardware, has completed a $1.5-million expansion and modernization program at its three major plants in Oakland, Calif., Chicago and Pittsburgh.

J. H. Williams & Co., Buffalo, will begin a $400,000 improvement program early in 1955. A number of machine tools, new transformer equipment and more die and heat treating equipment will be purchased and installed.

A $500,000-expansion program is under way at the Hazard Division of Okonite Co., in Wilkes-Barre, Pa.

Blaw-Knox Co. has an expansion and modernization program under way which is designed to integrate more fully the manufacturing operations of its several product lines. To be financed from earnings and from proceeds of $15 million in notes, the program includes establishment of centralized research and development functions to develop new products.

Blaw-Knox Co.'s Lewis Machinery Division is building three 62-in. aluminum rolling mills for Cochran Foil Co., Louisville, and two for Kaiser Aluminum & Chemical Corp.'s plant in Ravenswood, W. Va.

Diamond Alkali Co. will install a new radiation research lab at its research center at Painesville, O.

Ford Motor Co. will spend about $1.5 million to improve facilities at its assembly plant in Buffalo.

A. G. Kaddis Screw Products Co., Rochester, N. Y., plans to build an addition which will double the firm's manufacturing space.

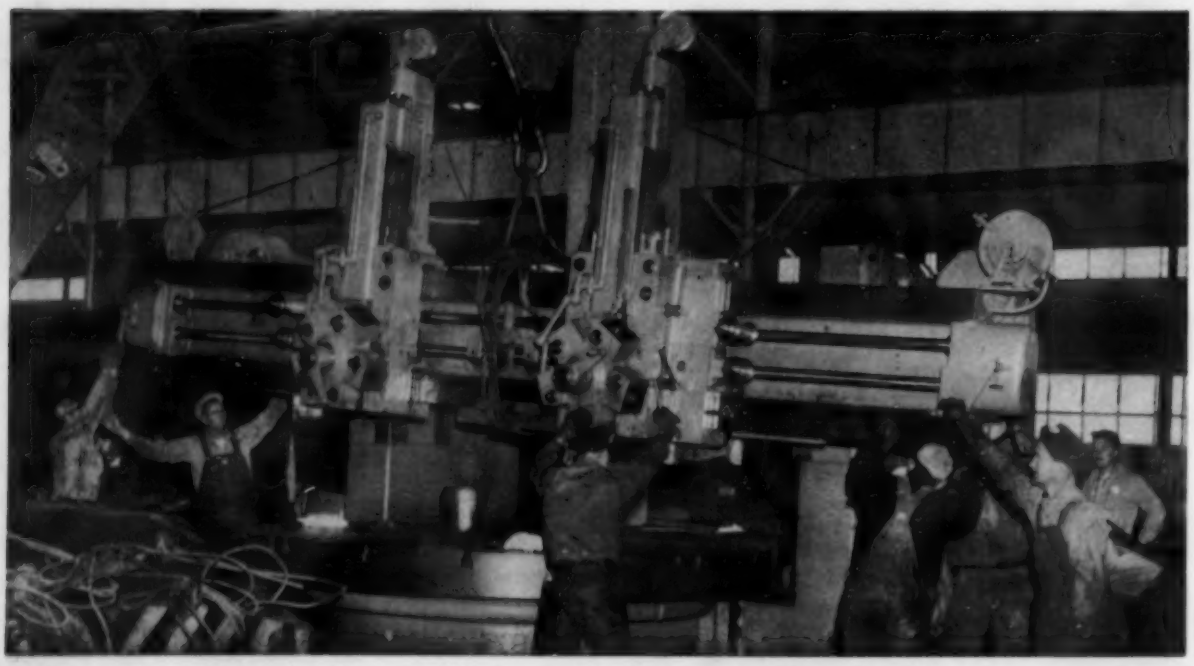
Bethlehem Pacific Coast Steel Corp., Bethlehem, Pa., will construct a $4-million plant at Torrance, Calif., for welded steel fabrication and riveted steel work.

Peerless Steel Equipment Co., Philadelphia, expanded its production facilities to make office desks, as well as its original line of filing cabinets.

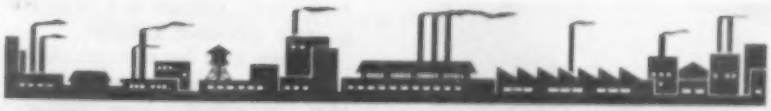
Fleming Steel Co., New Castle, Pa., will add about 11,000 sq ft to its plant this spring. Fleming Steel makes steel doors and other steel products.

Utica Cutlery Corp. has launched an expansion program with special attention to the production of stainless-steel tableware.

Metalworking firms, continuing to expand to improve their competitive positions, still make good markets for all kinds of metalworking goods.



More vertical turret lathes like this one will be on metalworking's equipment spending list this year



METALWORKING DOMINATES 100 LARGEST CORPORATIONS

	Assets (1953) Millions of Dollars	Percent of Total	Number of Co.
Metalworking	33,397.0	44.99	46
Chemicals	5,979.5	8.10	7
Food, etc.	5,858.8	7.90	13
Petroleum	23,315.9	31.40	21
Rubber	2,262.0	3.00	4
Textiles	1,160.6	1.60	4
Miscellaneous	2,241.8	3.01	5

46 Metalworking Corporations Among 100 Largest

(Total assets in millions of dollars)

Allis-Chalmers Mfg. Co.	401.5	International Business Machines Corp.	542.4
Aluminum Co. of America	905.7	International Harvester Co.	972.5
American Can Co.	452.5	Jones & Laughlin Steel Corp.	579.5
American Smelting & Refining Co.	363.8	Kaiser Aluminum & Chemical Corp.	340.7
Anaconda Copper Mining Co.	835.5	Kaiser Steel Corp.	261.1
Armco Steel Corp.	487.0	Kennecott Copper Corp.	747.6
Avco Mfg. Corp.	226.5	Lockheed Aircraft Corp.	260.4
Bendix Aviation Corp.	328.7	Nash-Kelvinator Corp.*	243.6
Bethlehem Steel Corp.	1,783.0	National Lead Co.	294.6
Boeing Airplane Co.	271.1	National Steel Corp.	576.4
Borg-Warner Corp.	260.3	Phelps Dodge Corp.	345.1
Caterpillar Tractor Co.	279.2	Pullman, Inc.	228.6
Chrysler Corp.	1,010.1	Radio Corp. of America	532.0
Continental Can Co.	320.6	Republic Steel Corp.	820.2
Deere & Co.	431.4	Reynolds Metals Co.	438.5
Douglas Aircraft Co.	273.5	Singer Manufacturing Co.	404.6
Eastman Kodak Co.	604.3	Sperry Corp.	259.1
Food Machinery & Chemical Corp.	222.7	United Aircraft Corp.	297.7
Ford Motor Co.	1,895.1	United States Steel Corp.	3,247.5
General American Transportation Corp.	226.2	Western Electric Co.	877.3
General Electric Co.	1,687.0	Westinghouse Electric Corp.	1,265.4
General Motors Corp.	5,383.0	Wheeling Steel Corp.	246.3
Inland Steel Co.	453.2	Youngstown Sheet & Tube Co.	514.0

* Name changed to American Motors, May 1, 1954 on merger of company with Hudson Motor Car Co.
Sources: Annual reports of companies; *Moody's Industrials*; "100 Largest Manufacturers in 1953," The Conference Board Business Record, Nov., 1954.

Assets: $74.2 Billion

SELECTED on the basis of asset size, the nation's 100 largest corporations include 46 metalworking companies, according to the National Industrial Conference Board.

Total assets of the 100 amount to $74.2 billion. Firms represented range in size from a little over $200 million to well over $5 billion.

A few large firms which do not publish financial reports are omitted.

Other Companies Grow Larger

The urge to merge, to grow larger, continues in metalworking. Some of the recent moves include:

The acquisition of Standard Rolling Mills Inc., Brooklyn, by Revere Copper & Brass Inc., New York. Joy Mfg. Co., Pittsburgh, purchased the physical assets of Baash-Ross Tool Co., Los Angeles. The newly acquired properties will be operated as Baash-Ross Tool Division of Joy. Mexico Refractories Co., Mexico, Mo., has purchased the assets of Niles Fire Brick Co. The annual production capacity of the newly acquired Niles company is more than 25 million silica and fire clay brick. Stockholders of Globe Steel Tubes Co., Milwaukee, approved the sale of its business to Babcock & Wilcox Co., New York. The acquired company will operate as part of the Tubular Products Division of Babcock & Wilcox.

A group headed by David G. Baird and Charles Shipman has purchased Beals, McCarthy & Rogers Inc., a steel and industrial supply distributorship in Buffalo. Chicago Belting Co., Chicago, has consolidated with two of its subsidiaries, Allis Rubber Corp. and Allis Seal Corp. These firms will now operate as divisions of the new corporation, Chicago-Allis Mfg. Corp. The organization manufactures industrial leather and molded rubber products and industrial shaft and face-type oil seals. Lunn Laminates Inc., Huntington Station, N. Y., acquired Ueber Tool & Mfg. Co., Detroit, and will operate it as a wholly owned subsidiary under the direction of Kurt Petrasch.

Producer of timber handling equipment, logging tools and appliances, American Logging Tool Co., Evart, Michigan, was purchased and will operate as a subsidiary of Broderick & Bascom Rope Co., St. Louis.

Barge Traffic Increases

Taking advantage of steadily increasing barge traffic on the nation's 28,383 miles of inland waterways, Dravo Corp. launched 166 barges of all types during 1954.

Concentrating on coal-carrying vessels, Dravo launched 99 open-hopper barges to transport coal from mines to Ohio river power plants which supply electricity for Atomic Energy Commission facilities.

Republic Steel Corp.

As construction continues its optimistic pace . . .

Metal Doors, Windows Go Boom

DOORS AND WINDOWS are opening up bigger sales for metalworking in 1955. Most producers are confident of equaling an "excellent" 1954. Many are predicting an even bigger year.

The longer-range view is still rosier. "By 1960 we're going to be in a *real* construction boom," says C. B. McGehee, general sales manager, Truscon Division, Repulic Steel Corp.

Expansions — Meanwhile, metal door and window manufacturers aren't standing still. For example, Ceco Steel Products Corp., Chicago, is sailing into 1955 with a realigned sales force, new products and plant expansions. Other producers are taking similar steps.

Steel doors and windows have the industrial field pretty much to themselves. This sales area accounts for a good share of both the dollar and tonnage volume of the industry. The ups and downs of federal spending may have some effect on sales. But, "we look forward to good business in 1955, especially in the first half," says H. H. Nutter, vice president, Kinnear Mfg. Co., Columbus, O.

Excellent Year—Fire doors had "wonderful" year in 1954. This year should be at least as good, says E. J. Bolduc, sales manager, Coburn Division, Wickwire Spencer Steel Division, Colorado Fuel & Iron Corp. Coburn is a large supplier of fire-door fittings.

A lush field for metalworking is growing in curtain-wall construction. Porcelain enamel, aluminum and stainless will benefit as curtain walls find increasing favor.

Seemingly a "natural" for prefab homes, curtain walls need more promotion before they'll make a dent in the residential market.

Education—Converting consumers away from traditional wood is one of the big jobs in the metal-door and window field. Metal windows have made pretty fair inroads into the market (roughly 35 per cent in 1954). Metal interior doors are becoming a more potent force. But here is one field that is really ripe for expansion, says the Steel Door Institute; sales managers agree.

Aluminum is sort of a "Johnny-come-lately" in the metal-window picture. But it's making up for lost time, especially in the residential market. Sales volume in 1954 was up more than 50 per cent from as recent a year as 1951, according to the Aluminum Window Manufacturers Association. "We're really getting ready for a good year," says E. S. Cohen, vice president of B & G Mfg. Co., Pittsburgh, maker of aluminum doors and windows.

Steady Output—The metal-door and window industry was pretty much out of the inventory adjustments of the past year. Most reported like Detroit Steel Products Co., Detroit: "Continued production at steady levels made for few inventory problems."

On the distributor level, the problem seems to have been one of understocking. The sales manager for one large producer says: "Distributors who kept stocks up, in general, did well in '54; those who let inventories drop saw business fall about in proportion."

Most manufacturers use a distributor organization. Some, like F. C. Russell Co., Cleveland, deal with distributors who handle metal products almost exclusively. But many firms have distributors who handle a more or less complete line of building materials. That brings up this problem: Some distributors and dealers are inclined to treat their metal windows and doors as a side line.

After sharp declines in volume and price last year . . .

Scrap's Coming Back in 1955

POSSIBLY the Miami Beach sun had something to do with it. But 750 scrap dealers and brokers attending the Institute of Scrap Iron & Steel convention, Jan. 5-8, at that Florida play spot, were a much happier crowd than the one that met in Washington a year ago.

Not all the improvement can be ascribed to the sunshine, however.

Fair and Busier — Currently, scrap prices are on their way up and so is consumption. A sharp rebound in purchased scrap consumption (possibly going to 28 million gross tons) is envisioned in 1955.

Last year, over-all, consumption of purchased scrap was estimated at about 23 million gross tons, down greatly from 31.5 million tons in 1953 and the record 34 million tons in 1951. In fact, in a nine-month period, beginning in 1953 and extending in 1954, the scrap industry experienced a reduction of about one-half in consumption and in prices. After this decline, the industry has emerged on what trade leaders think is the most solid basis in years.

Best in Years—Actually, says David C. Holub, president of the institute, there are three legs to the scrap industry stool: Domestic consumption, export demand and inventory position. Today, the legs are more nearly where they should be than at any time in 15 years.

Domestic consumption has recovered to about 2.5 million tons monthly, and the ratio of purchased scrap to home scrap and pig iron in the average steelmaking charge is back to about the average of the past decade.

Mainstay—Exports, the second leg of the stool, have been important in buoying up the market over recent months. Net exports, after deducting shipments to Canada, offshore movement and imports, were about 1,050,000 gross tons in 1954. The movement could be higher this year, reflecting requirements of the continental European countries.

During the year, attempts to impose an export tonnage limitation geared to domestic steel production were successfully warded off. But continued pressure for governmental restrictions is expected, especially as domestic steel production rises and scrap again becomes a wanted commodity.

Less in the Larder—Inventories, the third leg on the stool, are a little on the high side but are considered more normal than they have been for many months. Consumers' stocks of purchased and home scrap combined stand between 5.5 million tons and 6 million tons—a little below the average for 1954, but close to the level of 1953. Consumers' stocks are comfortable but are not considered excessive enough to hurt normal movement of scrap.

Consideration of a uniform contract in the purchase and sale of scrap, freight rates, better preparation of material for the market and a proposal to set up a research project aimed at developing new and supplemental uses for scrap were high on the agenda of business at the convention. Progress was reported on most of these problems though much work remains to be done.

All officers, headed by President David D. Holub, Iron & Steel Co., Akron, O., were re-elected. Two new directors at large were named: Louis B. Cohen, Nashville, Tenn., and Edwin L. Elk, Flint, Mich. All other directors were re-elected.

Purchased consumption: Perhaps 28 million tons

You're Inviting Proxy Battles When . . .

- You fail to keep pace with your competition and general business activity
- Your stock is undervalued
- Your earnings are not commensurate with your assets
- You neglect your stockholder relations

How To Keep Stockholders Happy

"IF YOU get backed into a proxy fight corner, come out swinging. Better yet, stay out of the corner!"

That's the admonition of a Midwest stock analyst. "Let's face it," he adds, "in nine out of ten cases management is to blame for the conditions leading to its proxy battle. Alert management doing an effective job has little to worry about."

More Coming — Proxy contests to wrestle company control from its existing management are increasing—some observers say the economic climate is favorable; the recent "spectaculars" tend to promote the vogue.

Causes of proxy fights vary (see the checklist). Sewell L. Avery, chairman of Montgomery Ward & Co., Chicago, is currently in a battle for control of that company with financier-industrialist Louis E. Wolfson. The issue is not that Montgomery Ward is losing money or is in financial difficulties; on the contrary, Mr. Wolfson says the company is too solvent and is not making enough money compared to its assets.

Management at the A. M. Byers Co., Pittsburgh, on the other hand, is being challenged by a Stockholders Protective Committee because the company lost a half million dollars in the fiscal year ended last Sept. 30.

Start Fast—But whatever the cause, once management finds itself in a proxy contest it should swing into action immediately to save its position.

1. It should do a little "soul searching" to determine if its shirt tails are really clean, comments one metalworker. "If they're not, chances are good that management will lose no matter what it does."

2. Call in an outside firm to make an impartial evaluation of stockholder sentiment to help formulate your plans. You'll need legal counsel, too, so that your activities don't conflict with Securities & Exchange Commission laws. For example, you can't solicit proxies before your annual report is made to the stockholders. All solicitations, too, must show the salaries of the directors and officers up for election, when the salaries are over $30,000. Your proxy solicitation letters, radio and newspaper advertisements should be cleared by the SEC before use.

3. Get your public relations machinery into high gear and make sure the stockholders get a complete story of what your company position is, what it's trying to do, how it evaluates the attempts of the outside forces to take over. The volume of literature put out in the struggle for control of the New York Central last year hit a high in public relations attempts by both camps.

Preventive Medicine—It's under the third point, too, that many executives feel that the most progress can be made in preventing many proxy fights from breaking out.

"Stockholder relations are just as important as labor relations," emphasizes one executive. "Good financial reports (STEEL, No. 15, p. 87) plus dividends commensurate with company operations are a must if good stockholder relations are to be maintained. There is no one standard which applies to all companies on the proper number of stockholder reports which should be made or the information that should be carried. The balance lies somewhere between what's required by law—one annual report — and giving out such information as will be of assistance to a competitor."

Union Aid — Another factor which has just appeared in the proxy fight picture is help from company unions. Motor Products Corp. was being assisted by its union in its battle to prevent General Tire & Rubber Co., Akron, from getting management control. Union

members of Motor Products plants in Detroit and Chicago were buying stock in hopes that their holdings plus those of management would keep control. General Tire last week withdrew from negotiations.

Outlook is for an increase in proxy fights:

There's a trend today for more dispersion of stock. This, many feel, creates more comparisons by stockholders of one company with another. Firms not measuring up to their competitors might find proxy fights on their hands.

Competitive Cause—As competition increases some companies may get pinched, causing alarm among stockholders and permitting an opening for outside forces to move in.

For some companies enjoying good business, the situation can develop where the book value of the company is considerably higher than market value of the stock. This tends to invite opportunists to move in and cash in quickly.

Byers, Erie Forge Plan Merger

Directors of A. M. Byers Co., Pittsburgh, and Erie Forge & Steel Corp., Erie, have agreed to a merger.

A. B. Drastrup, president of Byers and currently involved in a proxy fight with a group of dissatisfied stockholders, says the reason for the proposal is to gain strength for the future.

Lack of merger plans is one of the main complaints of the group challenging Mr. Drastrup for control of Byers.

Showdown on the proxy fight is expected Jan. 27 at the company's annual meeting. Meetings to consider the merger will be called immediately, says Mr. Drastrup.

The opposition has announced that the projected merger will have no effect on their plans to unseat present management.

The merger would result in Byers-Erie Corp., with a capital and surplus of $23 million. The resulting firm would have about 4000 employees and 2 million sq ft of facilities. Byers produces wrought iron. Erie makes finished steel forgings and castings, plus steel ingots from its open-hearth furnaces.

Patent Changes Being Printed

Part 1 of the waited-for revision to defense-contractor's patent-right regulations will be issued by the latter part of January. Controversial "Little d" paragraph is revised

AFTER ALMOST three years of work, revision No. 1 of the Armed Services Procurement Regulation dealing with patents is being printed.

Part 1, Section IX revisions, which began with hearings held by the Patent Policy Review Board beginning in January, 1952, will be issued around Jan. 24. They are effective 90 days after issuance.

Revisions—Main changes in the current ASPR edition in revision No. 1 are: 1. Elimination of provisions for title to patent rights under specified conditions. 2. Elimination of the requirements for the reproduction rights license under background patents. 3. Substitution of a prohibition against negotiating for patent rights under background patents which have been reduced to practice. 4. Changes in the Reporting of Royalties requirements. One important change in the latter is to excuse contractors from reporting royalties of less than $250.

There is also a new provision authorizing a military department to obtain patent rights under an approved product improvement program when the department is providing substantial financial support for such a program.

The ambiguous "little d" paragraph of the contract clause, which provides for reproduction and use of technical data, has been removed from the Patents Rights clause and is now a separate contract provision to be retained only until the forthcoming revision of Part 2, Section IX is completed on Copyrights and Technical Data.

Two items of general interest have been resolved as follows: The government will continue to obtain license rights under inventions first reduced to practice. However, the circumstances under which inventions may be excluded are clarified. Government will also retain the right to request foreign rights under inventions if the contractor doesn't seek them.

Solar Energy Gets Down-to-earth Use

They're putting the sun to work in India. Here, a line of sun cookers is being demonstrated at an exhibition in New Delhi. Invented by A. L. Gardner, a British scientist working in India as a UNESCO adviser, the cookers sell for about a dollar each. India's Prime Minister Jawaharal Nehru uses one

With a new four-point computer network . . .

GE Gets Faster, Cheaper Answers

AN IDEA of what is to come in data processing between remote points is revealed in General Electric Co.'s new four-point computer network.

Linked in the communications system are GE plants in Lynn, Mass., Schenectady, N. Y., and Evendale, O., where an IBM-701 computer is working three shifts daily. The fourth point in the hookup is IBM's Technical Computing Bureau in New York where GE rents a second 701 8 hours daily.

The Link—Tying the computing centers together is the IBM Electronic Data Transceiver, a device which duplicates punched cards by wire or radio. When problem data, originating at Evendale become greater than its computer can handle, they can be converted into punched cards and sent to New York for processing. Results can be returned to the point of origin by the same method.

The Transceiver hookup augments a network of telegraphic equipment GE has been using to deliver its problems and answers from turbine departments at Lynn and Schenectady to the computing facility at Evendale. Evendale will act as clearing house for these two points (until they have their own Transceivers early this year), and route them to its 701 or the New York 701, depending on the type of problem and machine availability.

Advantages—This system makes the two high-speed computers available to various groups of engineers throughout GE. It also provides a facility which one group might not be able to justify financially.

Although GE's computing network is concerned chiefly with processing of design and engineering problems, says Dr. H. R. J. Grosch, manager of investigations, Aircraft Gas Turbine Development department, it takes little imagination to envision a similar network tying in many plants and branch offices for central handling of standard accounting and record-keeping procedures.

Signal to start transceiver on hookup between GE's computing center and IBM's New York computer is given to Dale R. Cochran (seated), general manager at the Evendale plant, by W. P. Westfall (left), IBM's Cincinnati manager. Observing is Dr. H. R. J. Grosch, manager of the GE Investigations section at Evendale

Missile Spending To Climb

One of the most interesting items in the federal budget that President Eisenhower submits Jan. 17: A boost in guided missile spending to about $650 million for the year beginning next July 1. The expenditure in this fiscal year is $500 million.

The President also will reveal plans to spend more millions on missile research, construction of launching sites and the training of operating crews.

Even so, fiscal 1956's bill for missiles will still be only a fraction of total defense outlays, now hitting about $35 billion annually.

The boost in missile spending presages a time years from now when, as one top defense man says, "we'll be spending billions annually for missile procurement." Some proponents foresee a time when guided missiles will replace anti-aircraft guns, field artillery, fighter interceptors and long-range bombers. The Air Force is testing intercontinental missiles with ranges of 5000 miles.

The missile industry already embraces most of the nation's aircraft companies. Many other firms are getting into the act as suppliers—particularly those in the electrical equipment and automotive industries.

A boost in missile spending may encounter some congressional disfavor. Last year, the Senate Appropriations Committee criticized the program as overlapping and unplanned. Late last week, the Air Force was putting the finishing touches on a rebuttal to that complaint, with an explanation of how overlapping has been reduced.

To Improve the Federal Budget, CED Recommends...

- Changes in the preparation and form of the budget to give Congress and the public a clearer picture of proposed activities.
- Creation of a joint-policy conference as a step toward co-ordinating expenditure decisions and revenue decisions in Congress.
- Improvements in congressional procedures for considering expenditures.
- Authorization for the President to veto individual items in the appropriations bill.
- Establishment of a system of annual performance reports and periodic management audits of executive departments and large agencies, and the strengthening of the management staffs of the department secretaries.

Streamlining Budget Procedures

Buying power of the federal government has outgrown the methods used to budget that buying. Committee for Economic Development recommends tightening up the whole process

MEASURES to make the federal budget more informative and to help Congress act upon it were proposed last week by the research and policy committees of the Committee for Economic Development.

In a detailed analysis of the way the government determines its expenditures, CED also made suggestions for improving efficiency of government operations and evaluating performance. A digest of those recommendations is in the checklist above.

Raison D'Etre — Why the reforms? The committee points out that in fiscal 1954 the government absorbed about 16 per cent of all goods and services produced in the U. S., compared with about 5 per cent in 1939 and only 1 per cent in 1929. "With the federal government absorbing about one-sixth of all goods and services produced in the country, control of government expenditures has become vitally important . . . the manner in which the budget is prepared and the manner in which Congress considers (it) in making appropriations are at the heart of the problem," says the CED report.

The committee has aimed its proposals at the principal weaknesses in the budget-making process: The budget contains too much detail not relevant to major budget issues. But, it doesn't fully describe the services provided by government programs nor their costs. There is no systematic procedure in Congress to insure consideration of problems involving relations between expenditures and revenues. The expenditure decisions tend to be made between competing claims of various government programs without considering the burden of the whole. There is no systematic review of performance for evaluation of efficiency.

Clear Language — Specifically, CED calls for a more rapid development of the trend toward a "program budget." That is, one which groups expenditure requests by function and activities involving the same policy goal rather than by organization units. Says the committee: "Government activities should be described in such a way to make it easier for a congressman to judge the desirability of different government services. Activities should be described quantitatively and unit cost figures should be presented where feasible."

Some kind of joint policy conference is recommended as a means of co-ordinating expenditure and revenue decisions and adequate consideration of their long-run effects on the economy. These conferences would operate on subcommittee level.

Veto power for the President is also asked on specific items which would allow the rejection of one objectionable appropriation without vetoing an entire bill.

Tighten Up—A further step to tighten control of the federal purse strings is the recommendation that Congress be given control of expenditures early in the budgeting process, even before appropriations are made. Says CED: In fiscal 1955 "major programs amounting to $15 billion can be changed only by a change in the basic authorizing legislation."

While it is recommended that departments and large agencies have a strong and competent management staff, a further management audit was urged. In such an audit, experts from outside an agency would scrutinize every aspect of agency management. The President would be required to submit to Congress reports of the major findings of these audits and the consequent action that has been or will be taken.

Defense Building: Tax Break

Certificates of necessity for accelerated tax amortization amounting to $55,612,383 for 50 new or expanded facilities were issued by the Office of Defense Mobilization from Dec. 16 through Dec. 29.

ODM emphasized that the accelerated tax amortization certified by the agency represents investment of private capital and does not involve the investment of government funds. Direct defense loans are made only when the tax amortization incentive alone is not sufficient to accomplish the necessary industrial expansion. Two metalworking companies receiving certificates for over a million dollars are: United Aircraft Corp., Pratt & Whitney Aircraft Division, $1.1 million; and the Babcock & Wilcox Co., $1,530,500.

By E. C. KREUTZBERG *Washington Editor*

Under Ed Phelps' guiding hand . . .

ODM Reshapes Economic Controls

SELECTED BUSINESSMEN, labor specialists and professional men will be called shortly by Edward F. Phelps Jr., new assistant director for stabilization, Office of Defense Mobilization. The mission: To help prepare price, wage, salary, rent and rationing controls in the event of another war.

In taking over this post from Glenwood J. Sherrard, Mr. Phelps is using a different approach. The writing or rewriting of regulations has been abandoned for the present time.

First Things First—The next few months will be devoted to studies aimed at trying to evolve the basic concepts to be embodied in any future government-stabilization program. If these basic ground rules can be agreed upon, says Mr. Phelps, they will provide a foundation on which to write and rewrite regulations. In effect, he believes regulations cannot be profitably prepared in advance if the government's basic stabilization policies or philosophies are unknown.

Mr. Phelps is an experienced hand in this field. An executive in the food industry, he was called to Washington to take a leading part in creating the economic controls of the Korean war period. He stayed on throughout that war as assistant director of the Office of Price Stabilization in charge of all price operations. Recalling the stumbling start on the program because fundamental considerations had not been thought out beforehand, Mr. Phelps says that adequate planning now will save time and headaches later on in case of emergency.

Answers Needed — Specifically, Mr. Phelps told STEEL, we need answers to such fundamental questions as:

1. Should the controversial "earnings standard" of World War II and the Korean war be used again? Can a better formula be devised as one basic means of providing equity for business?

2. To what extent should "cost absorption" as contrasted with "cost escalation" be required?

3. What about "incentive pricing"? That is, should the U.S. use allowance of special prices as an inducement to encourage maximum production in war time?

4. What kind of wage and salary stabilization should we plan in case of another war? Should we have "cost-of-living" escalation as in the Korean war, permitting wage rate increases to compensate for increased living costs? Should we have a tripartite board, as in the Korean war and World War II, to administer wage stabilization? Is there a better way to do the job?

5. What do we do about economic controls should the enemy attack and take us into an immediate war? We will need to consider this kind of a situation from a wholly different viewpoint than was possible in the cases of the past two wars, says Mr. Phelps.

Plan of Attack—To get the answers to those knotty questions, Mr. Phelps will employ a two-layer organization. He envisions a top group of business executives and professional men to check his thinking and, in general, act as a board of directors. He sees this as a body of perhaps eight people. In addition, he will set up task groups, one for each of the major questions to be studied. Each group is to have as team leaders a couple of consultants recruited from business or the professions, with due consideration for labor and agriculture.

PROTECTS AGAINST TORRENTIAL DOWNPOUR

It's the 48" neck of a steel mill roll . . . and one of the toughest assignments in bearing protection. Scale is blasted off the red hot billets with cold water at 1800 psi. What steam! But specially designed C/R Oil Seals, with elements of Sirvene (custom designed, compounded and molded synthetic rubber) never fail in their protection of the vital bearings. C/R won't fail you either, whether your sealing problem is big or little, simple or complex. Chicago Rawhide offers you unequalled oil seal development experience and facilities . . . and a large stock of available types and sizes. You can get acquainted with C/R by writing for your copy of "C/R Perfect Oil Seals."

C/R

PERFECT
Oil Seals

More automobiles, farm equipment and industrial machines rely on C/R Oil Seals than on any similar sealing device.

CHICAGO RAWHIDE MANUFACTURING COMPANY

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IN CANADA: SUPER OIL SEAL MFG. CO., LTD., HAMILTON, ONTARIO

Other **C/R** *products*

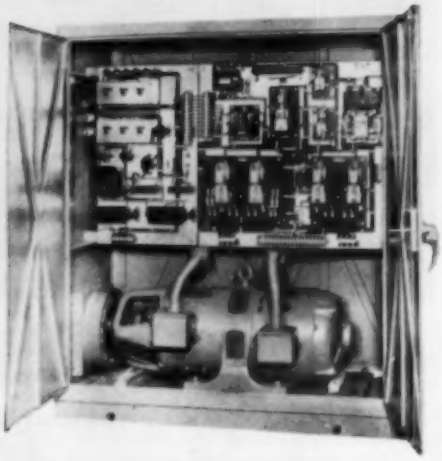
SIRVENE: (Synthetic rubber) diaphragms, boots, gaskets and similar parts for critical operating conditions • CONPOR: Controlled porosity mechanical leather packings and other sealing products • SIRVIS: Mechanical leather boots, gaskets, packings and related products.

DIAL THE SPEED—CONTROL THE PROCESS

with a Performance Rated® Century SELECTIVE SPEED DRIVE

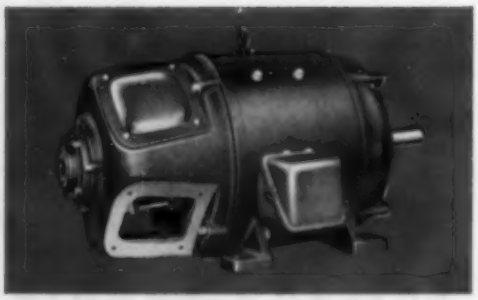
- **Offers automatic control integrated with your process.**
- **Covers a wide speed range—forward or reverse.**
- **Starts, stops—fast or slow.**
- **Allows forward or reverse jogs.**
- **Controls one or more motors.**

With a Century Performance Rated Selective Speed Drive, you can often integrate speed changes to cycle automatically as the process requirements dictate.



- You can automatically regulate metal cutting for optimum cutting speeds.
- Make the speed change automatically sensitive to changing temperature or pressure.
- Make the speed change automatically sensitive to changing diameter of a feed roll.
- Make the speed change automatically sensitive to the viscosity of a mix.
- You can use many different kinds of control devices in the control circuit to change speeds ... to jog ... to apply dynamic braking, etc.

You're welcome to full information on your specific drive problem. Call your nearest Century District Sales Office or Century Authorized Distributor, or write direct. See telephone listings.



Century makes A. C. and D. C. motors ⅛ to 400 H. P.

Century C MOTORS

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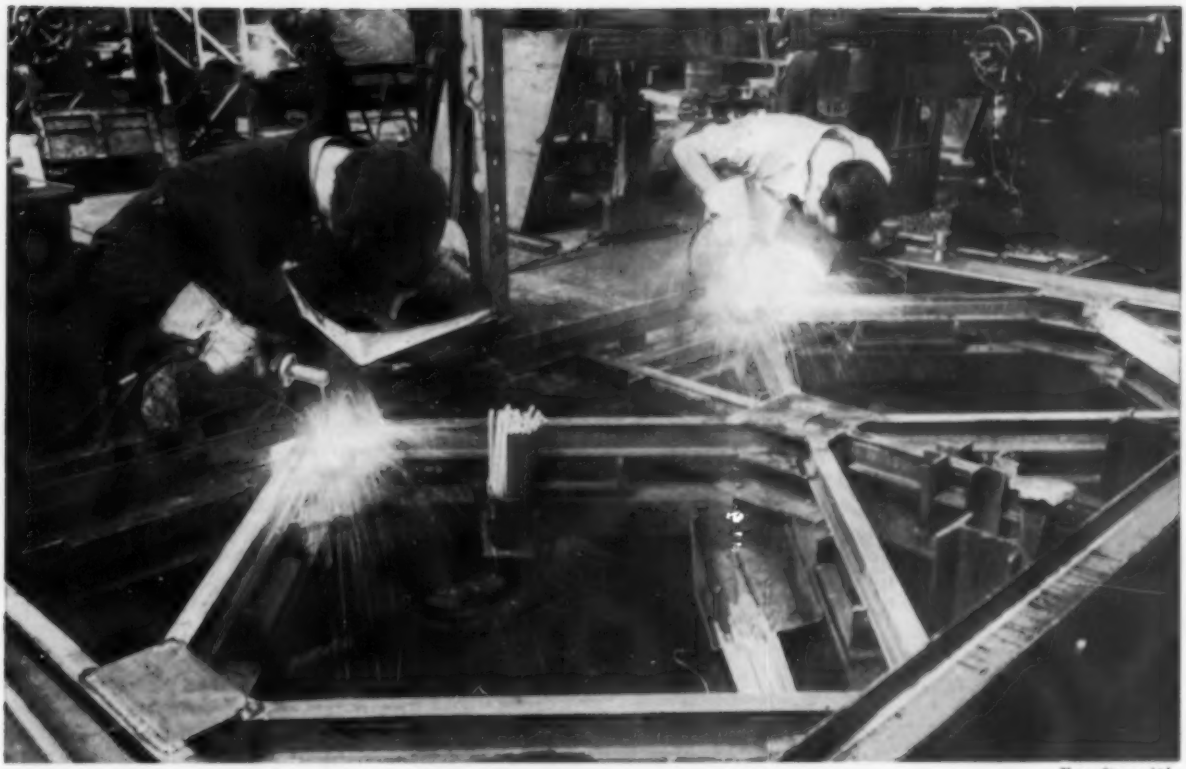


Thos. Storey Ltd.

First as emergency bridging then as a general construction component, the . . .

Demobilized Bailey Bridge Comes to America

BAILEY BRIDGING, a World War II invention which helped the allies hurdle many obstacles on the way to victory, will soon bridge the gap to the American civilian market more completely.

Already a prosperous civilian business in Great Britain, Bailey bridging is to be stockpiled at four points in or near prime U. S. markets (New York, San Francisco, Toronto and Miami). The aim is to build usage of the Bailey equipment in emergencies and for large engineering projects.

No Newcomer—Bailey bridging is not exactly a newcomer to the U. S., however. Thos. Storey Ltd., Stockport, England, has exported the equipment to 40 countries since receiving world manufacturing and selling rights in 1950. In the first 11 months of 1954, Storey Ltd. exported $2.8-million worth of Bailey bridging to 26 countries; a further $8.4 million in new orders is anticipated over the next six months. Part of those exports is for the U.S.

But Tom Storey, chairman and managing director of Storey Ltd., believes the U. S. market can take a much larger volume of Bailey equipment than it has in the past. Mr. Storey points to two big selling points: The cost of building with Bailey equipment can be as much as 25 per cent less than by using any other equivalent material because Bailey panels can be recovered and reused; time can be saved in erection through use of Bailey equipment. For example, Canadian engineers reported they saved nine months out of a three-year program on a series of Ontario (Canada) hydroelectric projects through the use of Bailey bridging.

Closer Look—Main component of the Bailey equipment system is a standard 5 x 10 ft panel of high tensile structural steel. Panels weigh about 600 lbs. Top and bottom members are pairs of 2 x 4 in. channel sections, which are welded to vertical and diagonal bracing members formed by 1½ x 3 in. I sections. The intersections of these members are reinforced with welded square plates. Holes are placed in top and bottom members so panels can be bolted together.

Though Bailey bridging may gain its entree into a larger U. S. market as bridging for emergency purposes, bridging is not the only use of the equipment. Other applications already made somewhere in the world: In falsework and form cages, dams, aggregate storage conveyors, ramps, brace girders, runways, office and workshop skeletons, piers, dikes, seawalls, tunnelling, stadiums, wharves and towers.

Storey Ltd. intends stockpiling five or six 100-ft bridges at the four points mentioned above to start its program for increased promotion of the American market.

U. S. productivity snowballs because . . .

Machinery Dollars Go Farther

AN INCREASING SPREAD between machinery and labor costs is boosting the performance of American industry.

A new Machinery & Allied Products Industry survey shows that since 1939 labor costs have climbed 33 per cent more than the cost of machinery for users of capital equipment. This is an average of almost twice the 1.13 per cent annual rate previously set for the years between 1922 and 1941.

Productivity Snowballs—The reduction of comparative costs works with a snowballing effect. Machines became cheaper than men; more machines are built and sold. Designers are stimulated to build in more user benefits, and the spread in performance of man and machine becomes still wider. The cycle repeats—paying off in bigger and bigger gains in productivity.

Construction costs, general industrial prices, prices of components and supplies and wages paid by machinery manufacturers have all risen much faster than the prices of machinery.

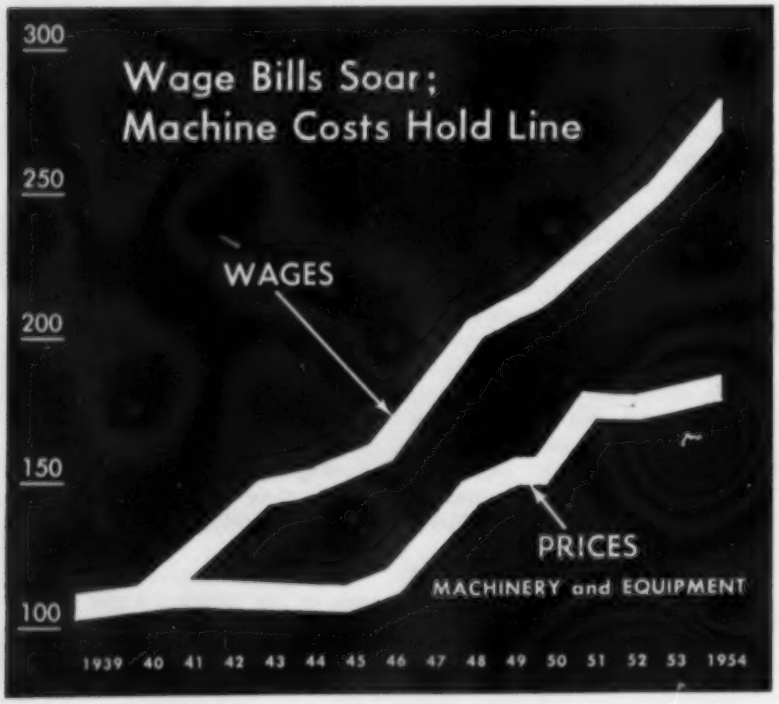
Particulars—By 1947, machinery prices had risen only 30 per cent above the 1939 level, compared with 64 per cent for industrial prices in general and 91 per cent for construction costs. By 1950, the increases over 1939 are put at 53, 76 and 119 per cent, respectively. By October, 1954, prices for machinery and equipment had advanced 78 per cent over those of 1939. General industrial commodities were up 97 per cent, iron and steel products up 110 per cent, nonferrous metals up 132 per cent and construction costs up 153 per cent.

Wages paid by manufacturers of machinery also shared in the general rise, being typical of industrial wages in general. From 1939 to 1954, the wage payments increased more than 167 per cent.

Wage rates quoted in the survey in most cases are understated, since they do not include fringe benefits like employer contributions to hospitalization plans, insurance and pension plans. These have been rising much faster than direct payroll costs since 1947.

Cheap Power Factor — The MAPI survey shows that the fuel, power and light industries most nearly manage to hold the machinery cost line. Though peaking to a considerably higher value in 1948, these basic factors have since leveled. Today, they are slightly below those of machinery, compared to their 1939 base. The relatively small labor factor in fuel, power and light is probably the basic reason for this. The consistently low power costs have contributed to the acceleration in productivity by keeping down machine running costs.

If the gap between prices and wages can be held and widened in the future, it is obvious that the acceleration of productivity will continue. The responsibility for this, says MAPI, rests largely on the ability of machinery and related product industries to keep on designing more efficient tools and equipment.



Save $500,000 a Year

It can be done. Speakers at AMA's Cleveland cost cutting conference tell how

WHAT DO you do when the boss says: "Cut costs $500,000 a year."?

How personnel from ten companies complied with that or a similar order was told last week in Cleveland at the American Management Association's conference on reducing production overhead.

Diverse—Routes taken to arrive at goals were as diverse as the production techniques involved. But all approaches had four things in common:

1. The cost-cutting program was planned and given general direction by top management. It was not left to chance; it was not left to the guidance of personnel far down the management ladder.

2. The specifics, the how-to details of the program, were set up by specialists — often employees put on detached service or even outside management consultants. Several firms found it profitable

to put on a cost-cutting committee at least one able employee who did not usually deal in such activities. He often provided a fresh approach that turned up unexpected opportunities for savings.

3. A goal was set and a running scoreboard arranged to let the people involved know how the program was progressing.

4. Everyone concerned was informed of the objectives and why they were necessary. It was specially important to tell employees and unions in advance about how displaced personnel, if any, would be handled.

Too Many Workers?—The advice on layoffs was this: Be fair but firm. No company that simply makes work to avoid firings can last long. It's jeopardizing the jobs of the other workers when it doesn't face facts. But sometimes the discharge of a good employee can be avoided. Perhaps the normal turnover will absorb many of your displaced people in a few months. Perhaps another department is expanding.

Consensus at the AMA conference was that management holds the key to cost-cutting—as it did in the case of Nowhere Corp. Nowhere produced widgets by plan A at a cost of $100,000 a year. Zealous Cost-Cutter proposed plan B to turn out widgets for $75,000 a year. Plan B was adopted, and it worked. But along came Eager Expense-Saver with plan C to make the widgets for $65,000 a year. It was adopted, and it worked. Then someone awoke to the fact that plan C was the same as plan A. Plan C was simply better administered, better managed than it had been when it was called plan A.

Moral: When you start cutting costs, start first with management slippages.

16,000 Trademarks Registered

Attempting to keep abreast of applications, the United States Patent Office registered 15,939 trademarks during the 1954 calendar year. Some 20,000 are pending.

The United States Trademark Association reports an increasing recognition of trademark importance by business.

Alcoa

Inventories down, demand up to squeeze out . . .

More Sales for Collapsible Tubes

COLLAPSIBLE TUBES are heading for another year of high-level production. Improved demand for this type of container that started during the second half of 1954 will continue through 1955, predicts Lester B. Platt, executive secretary of the Collapsible Tube Manufacturers Council.

"Increasing recognition is being given the collapsible tube as a lightweight, sanitary and durable convenience package," he declares. Another factor contributing to the industry's favorable outlook, Mr. Platt adds, is a smoother flow of orders due to a decrease in packagers' inventories.

A Billion Tubes—With final figures not yet available, output in 1954 may possibly exceed 1953 production of 6,682,405 gross—nearly a billion tubes. The industry will have used about 19 million pounds of lead, 6,160,000 pounds of aluminum and 1,250,000 pounds of tin in 1954, Mr. Platt says.

Tube production has almost doubled since 1939 and the industry has the facilities to increase volume further if demand warrants. This extra capacity resulted from a shortage of lead in 1948-49 and the high price and restrictions on tin in 1950-51. A larger demand for aluminum tubes was created which required purchase and installation of additional heavy extrusion presses.

Where They Went—End-use distribution of tubes in the first 10 months of 1954 reveals toothpastes accounting for about half of all production. Household and industrial products, medicinals and pharmaceuticals consume more than one-third of output. Cosmetics, shaving creams and foodstuffs make up the remainder.

The collapsible tube industry in 1954 held its prices relatively steady in the face of generally increasing wage and production costs.

everybody's favorite supermarket

made of flat-rolled steel

Appliances as well as kitchen equipment like cabinets and sinks need a good *suit of armor*—made of flat-rolled steel—when they're put to the test of normal use.

If you use flat-rolled steel in your products, rely on a specialist—Great Lakes Steel. Our entire organization is devoted to the business of making more and better flat-rolled steel for every application. Many manufacturers have found we have some unique qualifications to help them improve products and reduce costs. We would like the opportunity to work with you on your problems.

Call on our 25 years of specialization in flat-rolled products. Our representative will be glad to discuss your particular needs at your request.

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Ecorse, Detroit 29, Michigan

PRODUCER OF N-A-X HIGH-TENSILE STEEL

UNIT OF NATIONAL STEEL CORPORATION

SALES OFFICES IN CHICAGO, CLEVELAND, GRAND RAPIDS, INDIANAPOLIS, LANSING, NEW YORK AND PHILADELPHIA.

New Hudson Wasp four door incorporates single unit body

Restyled Packard 400 features new torsion bar suspension

Little Three Scan the Future

THE HONEYMOON'S over. The former independents, now the Little Three, will get down to some serious housekeeping in 1955.

Regardless of whether they moved into their own new home as Packard or moved in with the family as Kaiser and Hudson, the marriages are based on the premise that two can live more cheaply than one. The year ahead may answer the question: Did the independents say "I do" or "what else can I do?"

As all—except Studebaker which announced in October—bring out their new models, here's a look at each of the Little Three, its plans and its products.

Kaiser-Willys Counts on Jeep

The shifting emphasis from passenger cars to jeeps keynotes the Willys approach to 1955 and the future. Decrying the term "independent," Willys prefers to assume the title, "world's largest builder of four-wheel-drive vehicles." Pointing out that Kaiser-Willys exports of commercial vehicles ranked third in the first nine months of 1954 (exceeding not only Chrysler but also all the independents combined), the firm notes it gained 28.4 per cent in the field against 5.6 per cent by General Motors and 19.5 per cent by Ford.

If this can be done abroad, why not here? reasons Willys. To this end a program of sales training in the many applications of the four-wheel-drive jeeps, stations wagons, sedan deliveries and trucks is being instituted. It is under direction of Hickman Price Jr. who turned the trick overseas.

The shifting emphasis is also notable in the new passenger car announcements by the firm. As 1954 saw the Henry J slide into oblivion, 1955 finds the number of Willys models reduced from six to two. The Kaiser Manhattan is the only offering in the Kaiser line and then "in limited quantities."

The reduction in the number of models is a move to reduce parts inventory and tooling. But the big cost cutter, Willys believes, is its consolidation of facilities, now entering the final stages. With the move of the Detroit engine division to Toledo, the vast bulk of manufacturing equipment will be concentrated at the one plant, giving "minimum overhead and maximum efficiency," in the words of President Edgar Kaiser.

Full Line at Studebaker-Packard

Although Kaiser-Willys makes no estimate of its planned output in 1955, Studebaker-Packard Corp. plans 100,000 Packards and 200,000 Studebakers for the year. Another difference: The firm believes embracing the philosophy of the full line rather than specialization in one product is the key to success in the auto industry.

The basis of this belief is the extended distribution which a full line makes possible, providing volume for dealers who otherwise might not be able to sustain their operations.

The firm has also made strides in

facilities modernization. Great flexibility is also a strong point at Studebaker-Packard, as it is for all the Little Three. Studebaker, after its 1955 model run had already started, switched to wrap-around windshields on sedans and station wagons but slowed down only briefly in December to make the switch.

Big news in facilities during 1955 should come from the Studebaker end of the corporation. Executives have been surveying the Studebaker setup and will announce broad programs for better production efficiency similar in scope to those at Packard.

Nash Ambassador Country Club is available with 208-hp, V-8 engine

Diversification Aids American

Embracing a philosophy of diversification is the third of the Little Three, American Motors Corp. Ranking fourth among producers of major appliances behind Frigidaire, G.E. and Westinghouse, the firm also has an Export and Subsidiaries Division, the Hudson Special Products Division and the Automotive Division. Under the new organization of the firm they are autonomous operating and profit centers. The strength of the firm must be evaluated not merely as an automaker.

Willys custom four door has new grille, rear styling, speed lines

Auto, Truck Output

U. S. and Canada

	1954	1953
January	594,789	614,000
February	573,801	628,017
March	672,485	752,149
April	676,233	782,491
May	621,349	684,843
June	623,732	713,778
July	543,534	756,592
August	523,799	640,186
September	364,441	605,228
October	312,078	651,153
November	616,394	458,567
December	762,209†	529,588
Total		7,816,592

Week Ended	1954	1953
Dec. 11	176,075	113,145
Dec. 18	180,087	132,093
Dec. 25	149,418	92,247
	1955	1954
Jan. 1	148,436	93,293
Jan. 8	179,436†	152,418
Jan. 15	177,500*	149,841

Source: Ward's Automotive Reports. †Preliminary. *Estimated by STEEL.

Citing important product development and sales gains in the appliance field, American Motors Corp. also has recently acquired manufacturing and sales rights to the Mighty Mite. A possible major product for the Hudson Special Products Division located in the newly evacuated Hudson plant in Detroit, this vehicle could figure prominently in future corporate profit and loss statements.

Utilizing the same body shell and built on the same assembly line in Kenosha, Wisc., Hudson Hornets and Nash Ambassadors will be available with a 208-hp, V-8 engine purchased from Packard with Twin-Ultramatic.

In essence, American Motors believes that many of the benefits of merger are possible without merger; that with one firm tooling some components and another tooling others, neither need bear the full expense of the complete car at once.

The heaviest concentration of eggs will be in the Nash Rambler now being sold by both Hudson and Nash dealers. George Romney, American Motors Corp. president, points out that basic volume for maximum tooling and manufacturing economies is 800 to 1000 units per day or from 160,000 to 200,000 per year. He expects to bring Rambler volume to that figure within three or four years, with price cuts this year the first step in that direction. As to the outlook for 1955, Mr. Romney believes the firm will sell more than 300,000 units.

The consolidation of production facilities should play a big role in strengthening the firm's competitive position, believes Mr. Romney. He cites the cost of Nash and Hudson making the changes in new models independently this year. The cost ($24 million) can be pared to $9 million when the jobs are done together.

Stamina in Tough Service

B&W ALLMUL *with electrically fused grain for . . .*

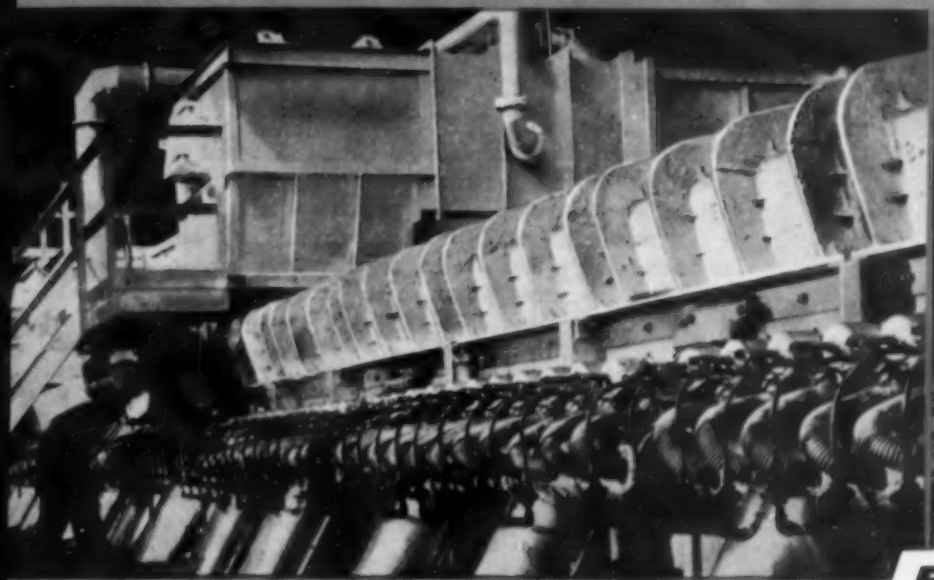
B&W Allmuls are used in many different kinds of heavy-duty furnaces. This example happens to be a butt weld furnace for continuous high speed welding of pipe. In the hottest areas (3000F or more), a mullite-*type* brick lasted only six weeks. Cause of failure: spalling, aggravated by metal penetration.

At the same locations, B&W Allmuls, made of electrically melted grain, lasted a full year—or more than eight times as long. It's by no means strange that the furnace operator now uses Allmuls for bungs, burner blocks, uptake arches and sidewalls, crossovers and furnace sidewalls.

Allmuls are volume produced by a highly efficient process. That's how you get—at relatively low first cost—top quality, fused-mullite brick with these properties: high hot load strength, high resistance to spalling, good volume stability, and a melting point of 3335F.

Whatever you're processing—steel or other metals, ceramics or chemicals—if your furnace demands a lining that can really take punishment, it will pay you to get complete facts on B&W Allmul. May we send you additional information?

A Close-up view of butt weld furnace where electrically-fused B&W Allmul far outlasted mullite-type brick. B Another view of butt weld furnace — charging end.



B&W REFRACTORIES PRODUCTS: B&W Allmul Firebrick • B&W 90 Firebrick
B&W Junior Firebrick • B&W Insulating Firebrick • B&W Refractory Castables, Plastics and Mortars
OTHER B&W PRODUCTS: Stationary & Marine Boilers and Component Equipment
Chemical Recovery Units • Seamless & Welded Tubes • Pulverizers • Fuel Burning Equipment
Pressure Vessels • Alloy Castings

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8000

Top: Clark Control Center for furnace control at Bohn Aluminum and Brass Corporation, Adrian, Michigan.

Insert: Separate access doors to vertical wireways simplify installation, inspection, service and maintenance.

SEPARATE VERTICAL WIREWAYS

Simplify installation and servicing of

CLARK CONTROL CENTERS

Roomy 6-inch wide vertical wireways for each section, independent of starter compartments and equipped with separate access doors, save time and money on installation of Clark Control Centers, and make them easier to service and maintain.

Ample wiring space is provided for all load and interwiring connections. Terminal boards may be located in vertical wireway adjacent to starters or at top or bottom of any section. Versatile bus-bar compartments permit the use of one to four sets of electrically isolated horizontal bus, permitting power to be fed from any or all of four different sources.

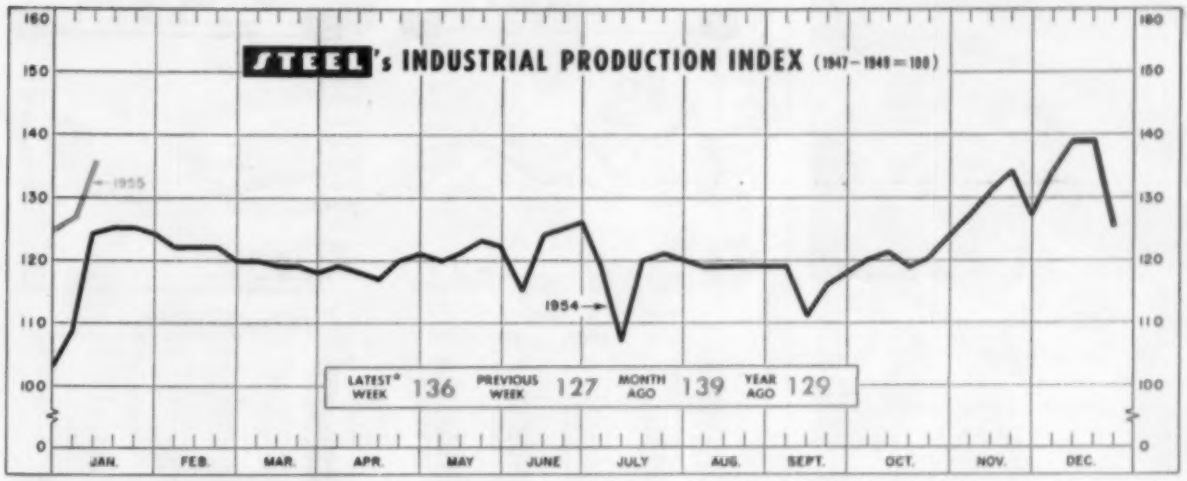
Clark Control Centers are the easiest to pre-plan and lay out because adding transformers and/or relays or changing type of construction (NEMA type A, B, or C) does not change space requirements.

Write for your copy of the 24 page illustrated book entitled "Control Centers by CLARK."

The **CLARK** **CONTROLLER** *Company*

Engineered Electrical Control

1146 East 152nd Street • • Cleveland 10, Ohio



*Week ended Jan. 8. Based upon and weighted as follows: Steel Output 35%; Electric Power Output 32%; Freight Car Loadings 22%; and Auto Assemblies 11%

Construction: A Pace-setter Again in 1955

CONSTRUCTION is making a strong bid to be a front-runner among the nation's industries again in 1955.

Getting it off to a good start was a smaller than usual drop in contract awards in fourth quarter. The new year itself opened strong, with heavy construction contracts soaring to $415 million in the first week.

Atoms—That's the largest opening week on record, 84 per cent higher than the first week in 1954, according to *Engineering News-Record*. Pushing the total upward were two large atomic-energy plant contracts. Private awards of $233 million accounted for well over half the volume.

Industrial building jumped off with $108 million; mass housing was up sharply to $102 million. State and local awards were off from a strong start last year.

Second Best—For all of 1955, ENR predicts a heavy construction volume of 8.5 per cent above 1954's. That will make $15.6 billion, the second highest dollar volume on record. Only 1952's total of $15.7 billion is better, and that was helped out by atomic-energy contracts of some $2.3 billion.

Sparking 1955 construction will be private building, expected to be up 7 per cent to a new high of $8.7 billion. State and local awards will be up 12 per cent. Federal spending of $1.4 billion is looked for, up from 1954 but far below 1952's record $4.5 billion.

New records are expected to be set in highways, commercial building, private mass housing and waterworks. Leading that parade will be a 12-per-cent jump in highway building.

Houses, Too—Adding into that bright picture, the outlook for continued high levels of residential building gives reason enough to look for a banner construction year again in 1955.

But what building is done will cost more. ENR's cost index rose 0.2 per cent from December to January. Raw material price

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	1,975	1,960	1,772
Electric Power Distributed (million kwhr)	9,700[1]	9,425	8,825
Bitum. Coal Output (1000 tons)	7,435	7,310	6,790
Petroleum Production (daily av.—1000 bbl)	6,375[1]	6,343	6,284
Construction Volume (ENR—millions)	$414.9	$216.1	$225.9
Automobile, Truck Output (Ward's units)	179,436	148,436	152,418
TRADE			
Freight Car Loadings (unit—1000 cars)	620[1]	529	624
Business Failures (Dun & Bradstreet, no.)	195[1]	152	202
Currency in Circulation (millions)[3]	$30,434	$30,638	$30,591
Dept. Store Sales (changes from year ago)[3]	−1%	+17%	−2%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$22,181	$19,205	$18,937
Federal Gross Debt (billions)	$278.8	$278.7	$275.1
Bond Volume, NYSE (millions)	$31.2	$26.4	$16.7
Stocks Sales, NYSE (thousands of shares)	22,946	18,486	7,083
Loans and Investments (billions)[4]	$86,534	$86,564	$81,302
U. S. Gov't. Obligations Held (billions)[4]	$36.9	$37.2	$32.8
PRICES			
STEEL's Finished Steel Price Index[5]	194.53	194.53	189.74
STEEL's Nonferrous Metal Price Index[6]	215.8	216.0	205.5
All Commodities[7]	109.6	109.6	110.4
Commodities Other Than Farm & Foods[7]	114.8	114.8	114.5

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1955, 2,413,275. 1954, 2,384,549. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

Your best cancer insurance...

"LIFETIME" POLICY... See your doctor *every year* for a thorough check-up, no matter how well you feel.

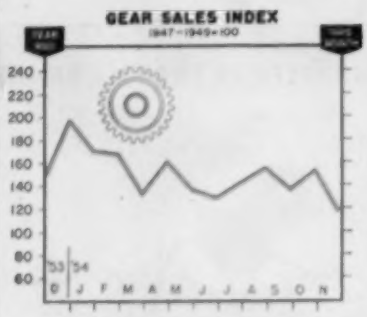
"DAY-TO-DAY" POLICY ...See your doctor *immediately* at the first sign of any one of the seven danger signals that *may* mean cancer (1) Any sore that does not heal (2) A lump or thickening in the breast or elsewhere (3) Unusual bleeding or discharge (4) Any change in a wart or mole (5) Persistent indigestion or difficulty in swallowing (6) Persistent hoarseness or cough (7) Any change in normal bowel habits.

Many cancers can be cured, but only if properly treated *before* they have begun to spread or "colonize" in other parts of the body.

For *any* information about cancer just call the American Cancer Society or write to "Cancer" in care of your local Post Office.

American Cancer Society

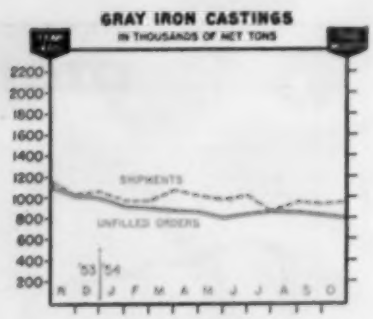
THE BUSINESS TREND



	1954	1953	1952
Jan.	167.4	161.4	670.6*
Feb.	165.1	158.1	539.5*
Mar.	128.6	156.9	517.1*
Apr.	158.2	217.1	478.7*
May	132.5	189.8	425.9*
June	127.4	146.5	452.3*
July	141.3	120.7	145.3
Aug.	154.7	121.6	132.3
Sept.	135.1	135.6	143.4
Oct.	152.3	211.1	160.8
Nov.	116.7	144.9	150.9
Dec.	....	194.0	140.9

*(1935-39=100)
American Gear Mfrs. Assn.

Charts Copyright 1955 STEEL.



	Thousands of Net Tons			
	Shipments		Unfilled Orders*	
	1954	1953	1954	1953
Jan.	932	1,162	872	1,333
Feb.	936	1,134	865	1,332
Mar.	1,047	1,264	842	1,278
Apr.	995	1,277	826	1,308
May	943	1,186	775	1,272
June	987	1,196	804	1,244
July	821	1,054	829	1,233
Aug.	935	1,060	830	1,223
Sept.	921	1,106	811	1,170
Oct.	942	1,142	789	1,076
Nov.	...	1,004	...	977
Dec.	...	1,032	...	955
Total		... 13,630		

*For sale. U. S. Bureau of the Census

hikes and small scattered wage boosts contributed to the increase.

Steel Employment Gains . . .

Also going up are steelworkers' wages. The average hourly payroll cost of wage earners in the iron and steel industry hit a new record of $2.391 in November, says American Iron & Steel Institute. Adding in cost of pensions, social security and insurance brings the average hourly employment cost up to almost $2.57.

November saw a reversal of the steady drop in steel employment. The estimated number of workers rose to 598,800, a gain of about 2700 over October. Also significant regarding the health of the industry was a rise in the average work week to 37.6 hours. That's an hour a week more than was registered in October.

Higher employment and the longer work week jumped total payroll to $247,722,000, highest since March, 1954.

New Orders Increase . . .

Something that's hesitating to follow the upward trend is inventory. But at least it's holding its own. And there are a few signs that a slight buildup is ahead (STEEL, Jan. 10, p. 27).

In November, says the Commerce department, new orders went up to $24.1 billion which is $3 billion over November, 1953. On a seasonally adjusted basis, the November figure was 2 per cent higher than October's.

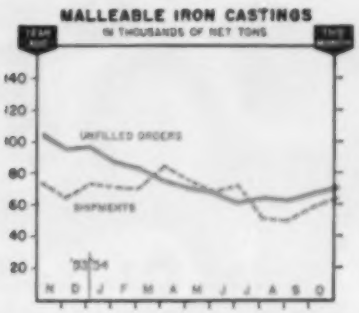
Inventories showed a gain of $100 million, but the rise was only seasonal.

Metalworking made out all right in the new orders column. Primary metals, fabricated-metal products and both electrical and nonelectrical machinery showed gains. Orders outpaced production, with a resulting increase in backlog.

More Appliances in 1955 . . .

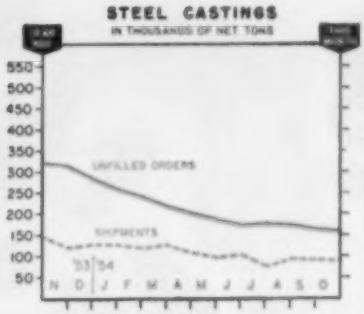
Westinghouse looks for record major appliance sales in 1955, hot competition notwithstanding, says R. J. Sargent, manager of major appliances.

The company's new models had a November-December sales gain of about 24 per cent over the same months of 1953. December sales of Laundromats and dryers were highest in history, some 30 per cent better than the second-best



Thousands of Net Tons	Shipments		Unfilled Orders*	
	1954	1953	1954	1953
Jan.	70.3	87.6	85.6	174.8
Feb.	69.1	86.8	81.6	175.1
Mar.	84.3	94.8	74.2	177.8
Apr.	74.5	96.3	69.1	174.5
May	67.9	82.3	67.0	160.4
June	72.8	86.8	60.2	151.0
July	50.9	77.4	63.7	137.3
Aug.	59.3	74.1	62.5	120.8
Sept.	58.0	74.6	66.7	114.5
Oct.	64.3	73.7	71.1	104.0
Nov.		63.7		93.2
Dec.		72.4		95.6
Total		926.1		

*For sale. U. S. Bureau of the Census.



Thousands of Net Tons	Shipments		Unfilled Orders*	
	1954	1953	1954	1953
Jan.	122.6	167.2	251.8	706.5
Feb.	116.5	175.7	234.6	644.3
Mar.	122.3	182.2	214.3	634.6
Apr.	105.8	179.6	197.9	573.6
May	94.6	165.6	182.5	525.0
June	100.0	164.7	169.6	475.8
July	75.8	139.6	170.6	467.9
Aug.	89.6	141.3	168.3	418.9
Sept.	88.4	135.3	156.8	327.2
Oct.	87.1	140.7	154.1	313.7
Nov.		114.1		308.5
Dec.		123.3		278.4
Total		1,829.3		

*For sale. U. S. Bureau of the Census.

month. Tied in with the prediction is increased production capacity at the company's new $45-million plant in Columbus, O.

Swatting a Myth . . .

High appliance sales help prove that any so-called saturated market is pretty much of a myth.

Families tend to upgrade their wants rather than become saturated, says National City Bank of New York. That opens the market for newer, better goods.

But in today's buyers' market, styling, quality and new features are more important than ever. So is price because the consumer is in a position to put off buying.

Opportunity Knocks . . .

And those conditions amplify a statement of H. H. Heimann, executive vice president of the National Association of Credit Men.

In most lines the small business with alert management "can run rings around a large company in an open competitive battle," he says. The smaller company is better able to give personal and special service and can adjust its operations to a given condition faster and easier.

Referring to the well-managed small business capitalized at less than $5 million and not requiring great research outlays or scientific investment to be competitive in product, service and price, he says: "Earnings per dollar of sales, per share of stock and even per capita production can and frequently do exceed those of a large company on a ratio basis."

Trends Fore and Aft . . .

Further improvement in coming months should be shown in New England employment, says the Federal Reserve Bank of Boston . . . About 2-million power-steering units have been installed in passenger cars since 1951. Over that period, prices have been halved. *Ward's Automotive Reports* looks for installations eventually to hit 60 per cent of auto production, compared to 1954's 17.9 per cent . . . TV-set production in November was at a record high for the month (858,501). Over 1-million radios were made, the highest monthly outturn of the year, reports Radio-Electronics-Television Manufacturers Association. . . . Chrysler, Ford and GM in Detroit paid out about $150 million in salaries and wages in December.

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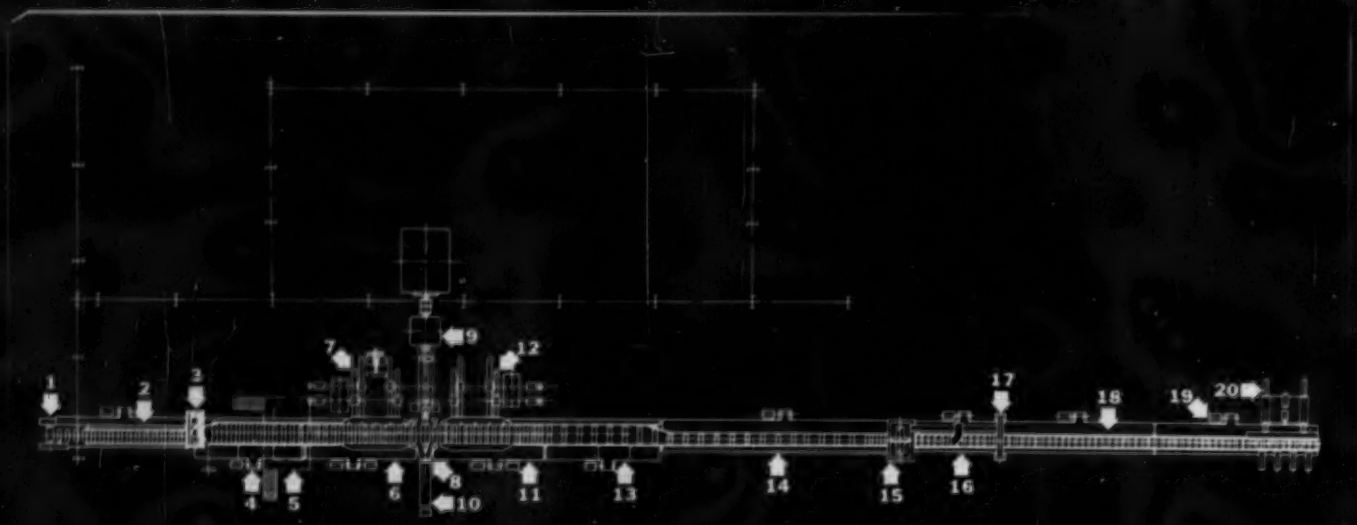
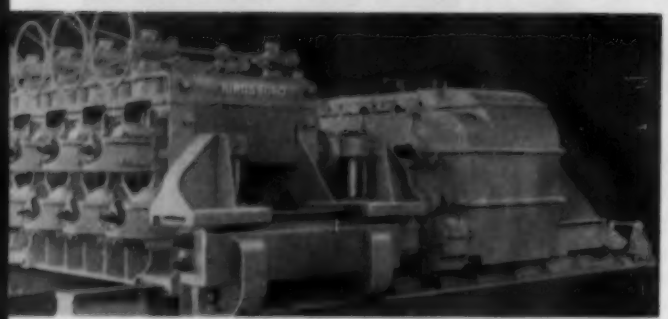
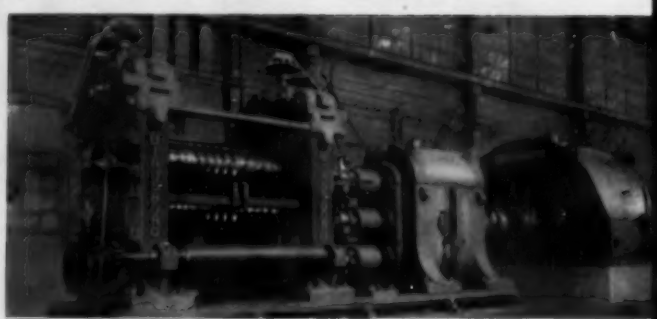
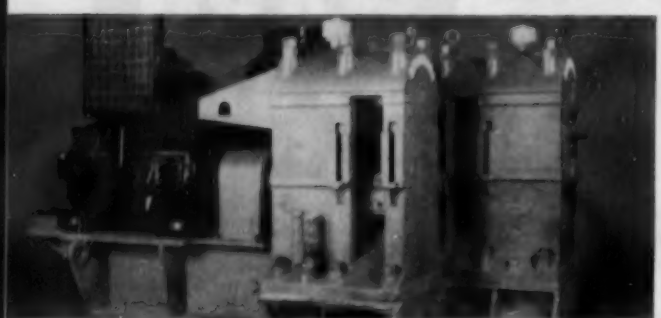


FROM COMPLETE MILLS . . . such as this 32" blooming mill layout





TO STRAIGHTENERS . . . . . TO ROUGHING MILLS



TO FLYING SHEARS . . . . . TO COOLING BEDS, for semi-finished products, and other auxiliary mill equipment

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TED OPERHALL
. . . heads Misco Precision Casting

JOSEPH H. KONIGSBERG
. . . a v. p. of Revere Copper & Brass

PAUL E. SHROADS
. . . National Steel senior v. p.

Ted Operhall was elected president, **Misco Precision Casting Co.**, Whitehall, Mich. He succeeds **Edgar D. Flintermann**, who will now devote his time in association with Misco Corp. Mr. Operhall has been vice president and general manager.

Richard W. Krieg, foundry sales engineer for **Crucible Steel Casting Co.**, Milwaukee, since 1948, was promoted to sales manager to succeed the late **John E. Schaible.**

Sylvan F. Chappuis was elected president, **Toledo Porcelain Enamel Products Co.**, Toledo, O., subsidiary of Bettinger Corp.

William A. Meiter, central sales manager, **Worthington Corp.**, Harrison, N. J., was promoted to general sales manager. He succeeds **Thomas J. Kehane**, now vice president-sales.

At **Burnside Steel Foundry Co.**, Chicago, **Frank B. Powers** was elected vice president and sales manager. He retains his office of secretary-treasurer. **James L. Jackson** was made assistant sales manager; and **Joseph E. Egan**, assistant to the president.

New Jersey Zinc Co., New York, appointed **W. C. Dunlap** manager of purchasing to succeed **W. J. Lee**, retired. **A. E. Turner** was made assistant manager-purchasing.

Joseph H. Konigsberg, formerly president of Standard Rolling Mills Inc., was elected a vice president of **Revere Copper & Brass Inc.**, New York. He will supervise activities of the new Standard Rolling Mills Division, purchased by Revere last month.

Elastic Stop Nut Corp. of America, Union, N. J., appointed **E. F. Nason** administrative assistant; **D. E. Lally**, general sales manager; **Donald B. Sorenson**, assistant general sales manager; and **James B. Duke**, product planning manager.

Paul H. Fox was elected president, **Southern States Iron Roofing Co.**, Savannah, Ga., a subsidiary of Reynolds Metals Co. He succeeds **Frank O. Wahlstrom**, retired. **Luther Stein**, who retired in April as senior vice president and general sales director of Belknap Hardware & Mfg. Co., was made chairman of the board. **H. Norbert Kirchdorfer** was made regional sales manager for Reynolds Metals, with headquarters in Chicago, to replace Mr. Fox.

Arch Miller was named manager of the tin mill of **Weirton Steel Co.**, Weirton, W. Va., division of National Steel Corp. He succeeds **Glenn W. Gould**, who was made assistant general superintendent of the mill.

Paul E. Shroads was elected senior vice president, **National Steel Corp.**, Pittsburgh. He formerly served as vice president and treasurer. He continues to fill the latter position.

J. Douglas Darby was appointed assistant executive vice president-commercial, **United States Steel Corp.**, Pittsburgh. He is succeeded by **Marcus J. Aurelius** as vice president and general manager of sales. Mr. Aurelius was vice president-sales, Columbia-Geneva Division.

Sidley O. Evans fills the newly created position of manager of tubing operations of **Babcock & Wilcox Co.'s** tubular products division plant in Beaver Falls, Pa. **David A. Edgecomb** was named to succeed Mr. Evans as superintendent of the extrusion department.

Promotions in the **Pratt & Whitney Division** of Niles-Bement-Pond Co., West Hartford, Conn., include: **A. S. Burgoyne**, manager of domestic gage sales; **A. F. Miller Jr.**, manager of domestic cutting tool and precision parts sales; and **J. B. Wilkie**, assistant manager of cutting tool and gage divisions.

Harold Bender was made production manager, **Pastushin Aviation Corp.**, Los Angeles. He formerly held the position of chief adminis-

E. C. RORK
. . . *Arcturus Mfg. v. p.*

ALEX J. VOGL
. . . *Wilton Tool v. p.-sales*

DAVID H. MACKEY
. . . *Simonds Saw & Steel sales mgr.*

trative engineer at Norris-Thermador Corp.

Arcturus Mfg. Corp., Venice, Calif., appointed **E. C. Rork** vice president. Associated with the company since 1939, he has been plant manager, machine and forge divisions, since 1949. He was elected a director in 1950.

Oliver D. Hale was made manager of plate and sheet sales for **Kaiser Steel Corp.**, Oakland, Calif. He was manager, rolled steel sales.

H. R. Fulton was made chief buyer for **Washington Steel Corp.**, Washington, Pa., responsible for all purchasing functions with the exception of hot-rolled stainless coils. **Howard H. Hildreth** was made manager of the newly created product development department.

J. H. Williams & Co., Buffalo, appointed **Edward R. Burkardt** sales manager and **Gerald W. Caruso**, assistant sales manager. **John B. Perkins** will slowly taper off his activities as vice president, tool sales, until Dec. 31, 1955, at which time he will transfer to the West Coast to be in charge of the Los Angeles office until retirement.

Electric Storage Battery Co. appointed **Wilbur W. Ferris** manager of equipment and plant engineering at Cleveland for the automotive division. **Earl R. Miller** succeeds Mr. Ferris as plant engineering manager at the Crescentville, Pa., plant.

Wilton Tool Mfg. Co. Inc., Chicago, promoted **Alex J. Vogl** to vice president - sales. Formerly sales manager, he is succeeded by **William J. Ferrick**, who was assistant sales manager.

Clarence Prather was made sales manager for **Comstock Steel Co.**, Phoenix, Ariz. He is in charge of sales in central and northern Arizona.

Howard Murray, formerly in charge of the Houston office of **Philadelphia Gear Works**, was transferred to the main office in Philadelphia as general manager of sales.

HOWARD MURRAY
. . . *Philadelphia Gear gen. mgr.-sales*

David H. Mackey was made sales manager, **Simonds Saw & Steel Co.** He will direct the sales program for the steel and specialty products of the Lockport, N. Y., mill. Mr. Mackey succeeds **C. R. Pafenbach**, retired.

Leo J. Kevitt was made manufacturing manager of the Alemite lubrication equipment and Stewart-Warner instrument division of **Stewart-Warner Corp.**, Chicago. **Edward G. Wicklatz** was made manager of Alemite and instrument engineering. The appointments fill the dual-vacancy created by the recent resignation of **David C. Peterson** as vice president and director of engineering and manufacturing.

Walter H. Roberts was made director of purchases of **Bunting Brass & Bronze Co.**, Toledo, O.

Morgan Engineering Co., Alliance, O., appointed **Roy P. Williamson** director of sales.

John J. Dixon succeeds **Frank H. Schwerin** as chief engineer, **Duff-Norton Mfg. Co.**, Pittsburgh. Mr. Schwerin retires after 36 years with the company.

William H. McCormick was made manager of sales, Park Alloy & Carbon Division, **Crucible Steel Co. of America. Herbert Whelan** was made warehouse merchandising consultant. They will have offices in Pittsburgh. **Felix Kremp** was appointed assistant manager, tool

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W. HARVEY THOMPSON

H. A. CHANDOR JR.

. . . elected vice presidents at Riverside Metal Co.

steel sales division, responsible primarily for sales of the division's products produced at the Park Works.

Jack A. Strahs was elected vice president-sales and a director of **Adam Metal Supply Inc.**, Long Island City, N. Y., a supplier of Alcoa aluminum mill products.

Norman E. Gutfeld, director and assistant to the chairman of **Builders Structural Steel Corp.**, Cleveland, was named to succeed **Charles D. Reese** as director of finance and secretary. Mr. Reese retired Jan. 1, but continues as a director. He had been with the corporation since 1942.

J. Ross Kemmerley was made sales manager of **Glascote Products Inc.**, Cleveland, subsidiary of A. O. Smith Corp. He succeeds **Bruce T. Clarke**, resigned.

Willis I. McCord, formerly with Allen B. DuMont Laboratories, was made manager of electronic sales by **Diamond Power Specialty Corp.**, Lancaster, O.

Columbia Tool Steel Co. named **John W. Higgins** district sales manager of its St. Louis territory.

Stephen P. Curtis was made chief engineer of **U. S. Steel Corp.'s** Fairless Works, Morrisville, Pa. He succeeds **Harry S. Spitz**, transferred to Pittsburgh as chief engineer, Homestead District Works.

W. Harvey Thompson and **H. A. Chandor Jr.** were made vice presidents of **Riverside Metal Co.**, a division of H. K. Porter Co. Inc. at Riverside, N. J. Mr. Chandor also will be general sales manager. Mr. Thompson will be in charge of all activities at Riverside Metal and its Keystone Watch Case Division.

R. F. Allen and **C. I. Young** were made vice presidents of **Laclede-Christy Co.**, St. Louis, a division of H. K. Porter Co. Inc.

Vapor Heating Corp., Chicago, appointed **Charles E. Impey** executive engineer.

Charles L. Stevens was made director of market research for **Burroughs Corp.**, Detroit, to succeed the late **Harold F. Waite.**

Stanley H. Hallberg was made purchasing agent, Buffalo, N. Y., branch, **American Brass Co.** He succeeds **Leland H. Kirk**, transferred to Waterbury, Conn.

Donald K. Morgan was made general sales manager, **Metal & Thermit Corp.**, New York, following retirement of **John B. Tinnon**, vice president and chief sales executive, who remains with the firm as a consultant. **O. L. Howland** was made assistant to the general sales manager, with headquarters in East Chicago, Ind. **Merritt L. Smith**, manager of advertising and sales promotion, assumes additional duties of eastern assistant to the general sales manager, with headquarters in New York. **Robert T. Brown** was made manager of sales, welding division, located in New York, and is replaced as district manager at Pittsburgh by **Kenneth H. Zeigler.**

William G. Gillett was made works manager of the Culver City, Calif., plant of **Merit Products Inc.**

William Niessen and **Kenneth F. Potter** were made assistant chief engineers of **American Hoist & Derrick Co.**, St. Paul.

Leroy W. Davis was made technical superintendent at **Kaiser Aluminum & Chemical Corp.'s** aluminum forging plant in Erie, Pa.

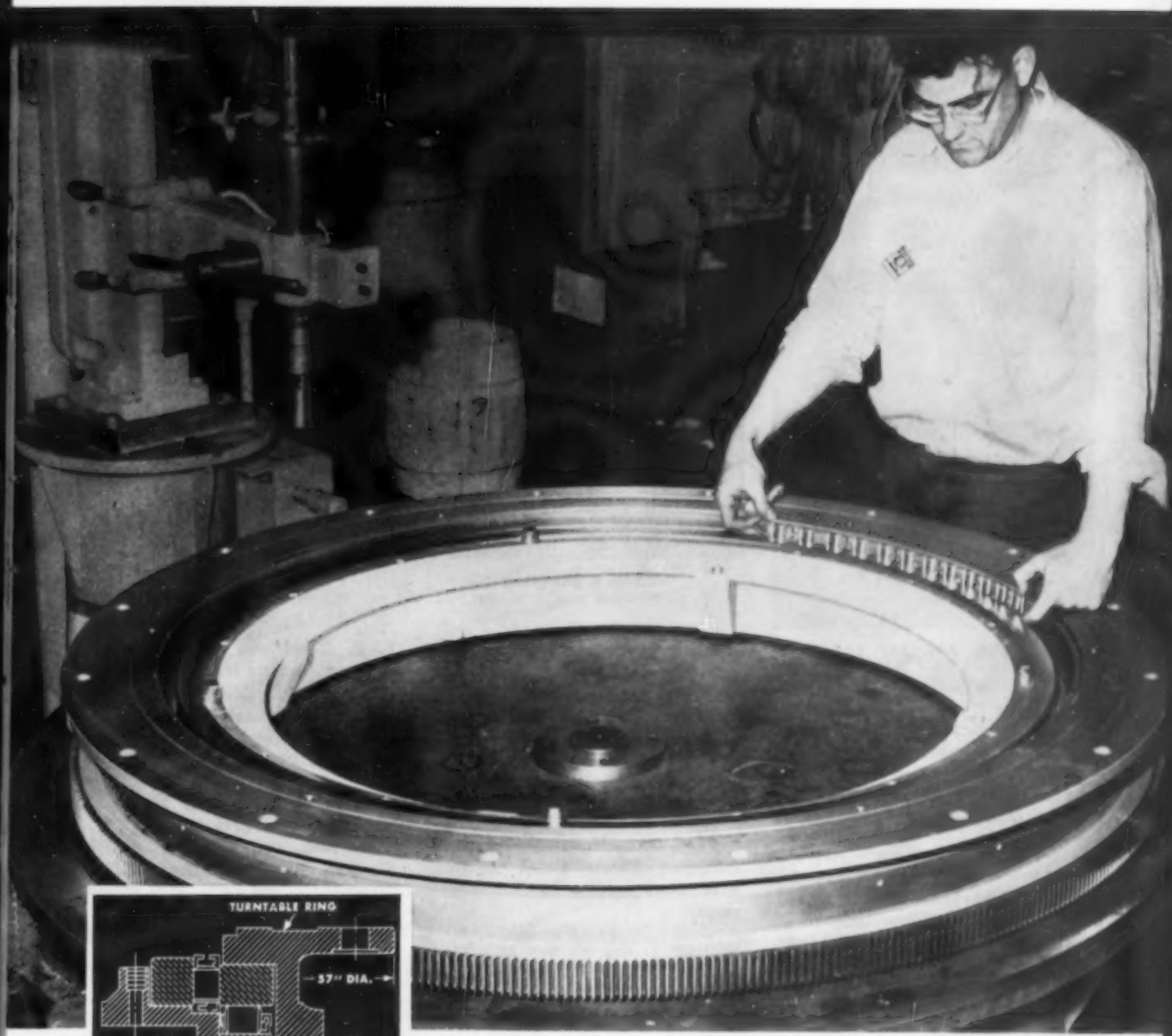
Oil Well Supply Division, Dallas, U. S. Steel Corp., named **M. F. Hazel** vice president-sales, and **Alex Quayle**, director of engineering. **Lloyd E. Tracy**, former vice president-sales, was named vice president-merchandise. **Dan H. Barr** was made assistant to vice president-sales.

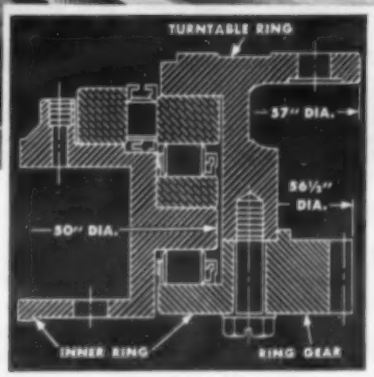
Follansbee Metals Corp., Pittsburgh, newly formed, appointed **Mark C. Craven** vice president in charge of Pittsburgh operations; **Thomas E. O'Neal**, vice president in charge of Rochester, N. Y., operations; and **L. E. Larson**, vice president in charge of the Wallingford, Conn., operations.

Dr. Theodore I. Leston was appointed executive vice president, **Permagile Corp. of America**, New York, a new affiliate of American Agile Corp. **W. B. Kriewall** is vice president in charge of research, development and production.

American Can Co., New York, elected vice presidents for its Atlantic and Pacific divisions. **G. W. Reese**, general manager of manufacture, was elected vice president in charge of the Atlantic division, with headquarters in New York. He succeeds **S. D. Arms**, retired. **R. C. Stolk**, sales manager of the Pacific division, is now vice president of the division, headquarters in San Francisco. He succeeds **C. W. Roberts.**

Kaiser Aluminum & Chemical Sales Inc., Chicago, appointed **Cornell C. Maier** assistant product manager





Switch to SSW forged rings in bearing assembly adds to "ultra-accuracy" of naval gun director

Three forged rings which are the major parts of this bearing assembly for a naval gun director contribute to required "ultra-accuracy." By switching to Standard Steel forgings in two of these rings General Electric Company, Pittsfield, Mass., gets *all* these benefits.

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L. A. SELIN
. . . Eaton pump div. sales mgr.

WILLIAM S. PATTERSON
. . . Hill-Chase Steel v. p.-sales

T. E. GILLEN
. . . Bethlehem Pacific's Seattle chief eng.

of aluminum rod, bar and wire products.

L. A. Selin was promoted to sales manager of **Eaton Mfg. Co.'s** pump division at Marshall, Mich. He will continue to be located at his present office, 9771 French Rd., Detroit.

Charles T. Everett was elected president and general manager of **Beaver Pipe Tools Inc.**, Warren, O., and also was elected a director. Mr. Everett resigned as vice president of Bingham-Herbrand Corp. and joined Beaver Pipe Tools last May as executive vice president-general manager.

Joseph T. Ryerson & Son Inc., Chicago, appointed **Weaver E. Falberg** general manager of sales, and **John A. Houston**, assistant general manager of sales.

Michael P. Apostolik succeeds **Harold W. Schroeder**, retired, as manager of **Wheeling Steel Corp.'s** New York district sales office.

William S. Patterson was elected vice president-sales, **Hill-Chase Steel Co.**, Baltimore. He has been manager of sales since 1946.

Joseph Dixon Crucible Co., Jersey City, N. J., promoted **H. E. Ehlers** to general sales manager; **R. C. Brock** to industrial sales manager; and **D. C. McMillin** to district manager, Pacific Coast district, with headquarters in San Francisco.

William T. Ingram was appointed general sales manager, regional sales, **Reynolds Metals Co.**, Louisville, a newly created position. He was sales manager of the firm's Pacific Coast region, and transfers from Los Angeles to sales headquarters in Louisville.

P. C. Clarke was elected director and appointed vice president of **Eastern Metals Research Corp.**, New York. Mr. Clarke is executive vice president and director of Hunter Spring Co., Lansdale, Pa.

T. E. Gillen was appointed chief engineer, Seattle steel plant, **Bethlehem Pacific Coast Steel Corp.** He became a member of the corporation's engineering department in Seattle in 1939.

Herbert B. Clark was appointed executive vice president of **Fansteel Metallurgical Corp.**, North Chicago, Ill., and its subsidiaries, Vascoloy-Ramet Corp., WW Alloys Inc., and Tantalum Defense Corp. He had been president and general manager of Vascoloy-Ramet.

David H. Boyd was elected president, **Union Supply Co.**, Pittsburgh, subsidiary, U. S. Steel Corp. He succeeds **Frank R. Walton**, retired.

Joseph J. Kovaleski joined the staff of **Coulter & McKenzie Machine Co.**, Bridgeport, Conn., as Draw-Pak sales and application manager. He formerly was with Driscoll Wire Co., where he served as assistant general manager.

OBITUARIES . . .

E. Franklin Motch, 46, president and treasurer, **Motch & Merryweather Machinery Co.**, Cleveland, died Jan. 6. He joined the firm in 1933, became vice president-treasurer in 1946, and succeeded to the presidency in 1953.

Harry W. Trump, 63, southwest district manager, industrial division, **Timken Roller Bearing Co.**, died Dec. 25 in Dallas.

Phillip A. Wilner, manager of the Detroit district office of **CEC Instruments Inc.**, died Dec. 17.

Donald F. Grace, 52, vice president-secretary, **Chicago Steel Service Co.**, Chicago, died Dec. 29.

Frank T. Moore, 56, sales engineer for **Reeves Pulley Co.**, Chicago, died Dec. 26.

Carl L. Wehrle, comptroller and purchasing agent, **Ramsey Chain Co. Inc.**, Albany, N. Y., died Dec. 18.

Wiley W. Stephens, 87, former chairman of **Stephens-Adamson Mfg. Co.**, Aurora, Ill., died Dec. 29.

J. Henry DeBoer, 71, president and treasurer, **DeBoer Mfg. Co.**, Syracuse, N. Y., died Dec. 30.

William C. Hughes, 59, president, **Bright Steel Co.**, Jersey City, N. J., died Jan. 4.

Capsule Case History:

...before you leap

A careful look by Kaiser Engineers often results in departure from traditional methods in developing plant designs that anticipate the client's needs for future expansion and improvements. Numerous examples of this type of cost-saving engineering foresight are to be found in work performed by Kaiser Engineers in the broad fields of industrial design and construction.

A New Ore Body presents unknown problems when first fed to blast furnaces. Planning for feed requirements, Kaiser Engineers laid out a comprehensive raw materials area designed to provide the greatest latitude in sizing and blending and at the same time provide for expansions which later were made according to plan. Such engineering is available to your firm.

Further information is included in a reprint titled "Fontana Plant," yours upon request.

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Truscon Gets Big Award

Contract covers fabrication of 750,000 lb of stainless steel for skyscraper

A MAJOR TOOLING-UP is under way at Republic Steel Corp.'s Truscon Steel Division plant in Youngstown to fabricate the stainless steel exterior sheathing and windows for the 42-story Socony-Vacuum building being constructed at 42nd street and Lexington avenue, New York. The structure, scheduled for completion in 1956, will be the sixth largest office building in the world.

Equipment is being designed, built and installed in the plant to produce virtually the entire exterior of the building. Truscon will fabricate more than 3200 Republic-developed stainless steel windows which will pivot a full 360 degrees on a vertical axis to permit cleaning from inside the building.

Embossed Panels—Stainless steel wall panels will separate the windows. These will be embossed with three-dimensional triangular patterns to give a striking light and shadow effect.

More than 750,000 lb of stainless—to be supplied by Republic and other major producers—will be used in the new skyscraper. Truscon has contracted to handle all the fabrication.

Production of the windows and panels is scheduled to begin in the spring, says D. K. Forsyth, Truscon's works manager.

Substantial weight saving will result from the use of stainless steel sheathing, which weighs about 2 pounds per square foot, compared with about 48 pounds per square foot for a 4-inch-thick brick exterior wall.

Bettinger Grants Rights

An agreement between Graham Bell Ltd., Streetsville, Ont., and Bettinger Corp., Waltham, Mass., will enable the former firm to produce and sell in Canada the many Bettinger-designed products. Under the supervision of Bettinger, Graham Bell will allocate funds for research and equipment, including new enameling furnaces. Bettinger products include architectural porcelain enamel, high-temperature ceramic coated parts for aviation and industrial use, chalkboards for schools and institutions, and V-Corr roofing and siding material.

Valvemakers Open Plant

Sinclair-Collins Valve Co. and Valvair Corp., Akron, opened a new plant in Canton, Pa., to be operated under the name of Collins Valve Inc. The plant will be in production Feb. 1. Engineering sales and administrative offices will remain in Akron.

Enameling Firm Expands

California Metal Enameling Co., Los Angeles, purchased the West Coast manufacturing facilities of Seaporcel Pacific Inc., Long Beach, Calif., for the manufacture of architectural porcelain enameled products.

Enthone Renames Division

Enthone Inc., New Haven, Conn., manufacturer of chemical products for metal finishing, changed the name of its Conn. Metalcraft Inc. division to Comco Inc. This corporation makes plating racks, fixtures, filters, plastic tanks, ventilating ducts and is engaged also in the sale of general equipment for the electroplating industry.

Virginia Steel Opens Branch

Virginia Steel Co. Inc., Richmond, Va., opened a sales office at 800 Peachtree St., Atlanta. John M. Switzer is sales engineer in charge.

Link Aviation Buys Plant

Link Aviation Inc., Binghamton, N. Y., purchased the plant of Drybak Corp., that city, and will use the property for "light manufacturing."

Weltronic Changes Name

Weltronic Induction Heating Corp., Detroit, changed its name to Welduction Corp. The firm makes induction heating and automatic arc welding equipment.

REPRESENTATIVES

Waldes Kohinoor Inc.'s Truarc Division, Long Island City, N. Y., appointed Bearing Engineering Co., San Francisco and Oakland, as distributor for its retaining rings, grooving tools, pliers, applicators and dispensers in Northern California.

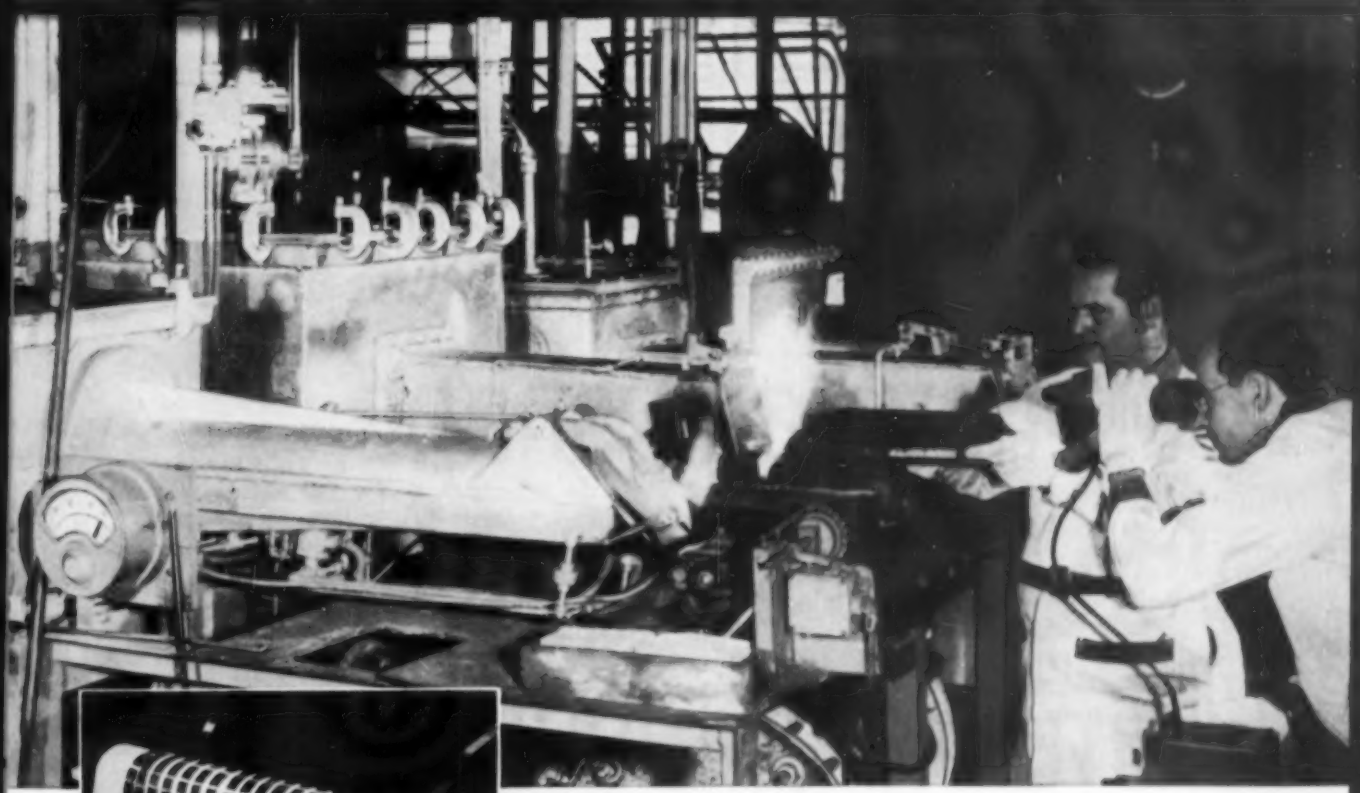
Nutting Truck & Caster Co., Faribault, Minn., appointed Pope Equipment Co., Cincinnati, as its sales representative for that territory. Nutting makes floor trucks, casters and wheels, in addition to its other lines of materials handling equipment.

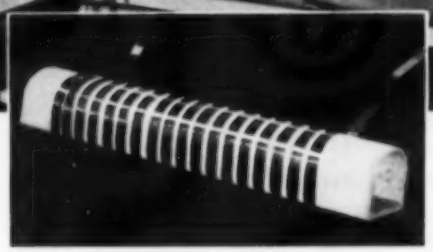
Mattison Machine Works, Rockford, Ill., appointed George M. Meriwether as its representative in Alabama. The company makes over 50 types of grinders.

Morse Chain Co., maker of power transmission equipment with headquarters in Detroit, appointed five new distributors: Southern Bearings Service Co., Memphis, Tenn., and Little Rock, Ark.; Kelly Supply Co., Grand Island, Nebr.; L. B. Adams & Co., Baton Rouge, La.; Fisher Bros. Co., Astoria, Oreg.; and Neiman Bearings Co., St. Louis.

Kling Bros. Engineering Works, Chicago, maker of metal fabricating machinery, appointed the following distributors: Harron, Rickard & McCone Co. of S. California, Los Angeles; Harron, Rickard & McCone Co. of N. California, San Francisco; and Dawson Machine Co., Seattle.

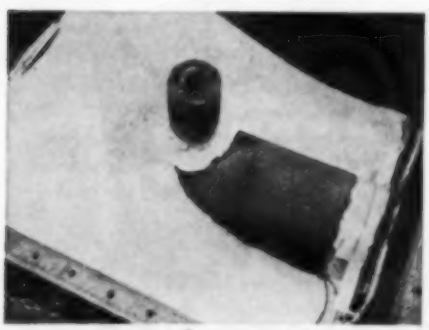
Salem-Brosius Inc., Pittsburgh, appointed W. P. Wooldridge Co. as its representative in California, Washington, Oregon and Utah. The distributor has offices in Burlingame, Calif.; Los Angeles, and Salt Lake City, Utah. Salem-Brosius products include heating and heat-treating furnace equipment, furnace charging machines, forging manipulators, valves, blast furnace clay guns and other special equipment for the mining, metalworking and similar industries.





This molybdenum ribbon-wound ALFRAX muffle is rugged and long-lasting.

ALFRAX tubes and muffles will not react with atomic hydrogen.



Complete insulation with alumina "bubbles" . . . by the shovelful.

For high-temperature electric furnaces

ALFRAX® REFRACTORIES

resist atomic hydrogen and extreme heat

. . . are easily installed!

CARBORUNDUM® has developed a complete line of refractories for hydrogen or cracked-ammonia atmosphere furnaces heated by molybdenum elements. ALFRAX PK refractories are made of pure granular alumina and resist temperatures up to 3000 F. (They contain no silica or reducible oxides . . . to be affected by atomic hydrogen formed at these extreme temperatures).

ALFRAX materials come in a wide variety of forms to fill furnace-design needs:

. . . **as muffles, tile, brick,** or other normally required special shapes.

. . . **as tiny bubbles of pure alumina** that can be shovelled into muffle-type furnaces . . . for insulation between the shell and the wound muffle.

. . . **as pure alumina castable cement** that is simply mixed with water for use anywhere you want the convenience of a castable.

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ALFRAX refractories offer other advantages—chemical inertness, excellent electrical resistance at high temperatures, and dimensional acccuracy. Write today, for your free copy of our booklet on these refractories for high-temperature electric furnaces. Address Dept. W15, The Carborundum Company, Refractories Division, Perth Amboy, N. J.

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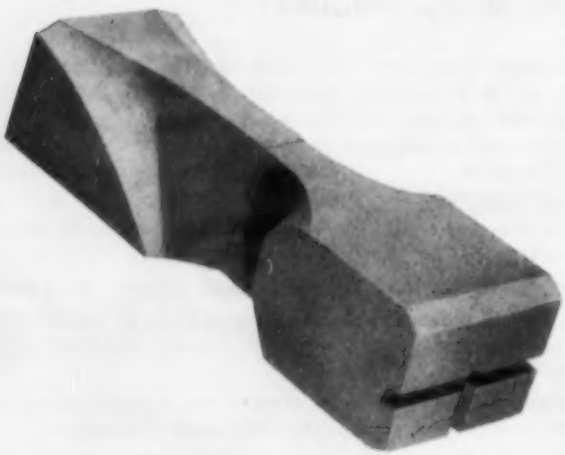
. . . also offers these advanced special-purpose super refractories: silicon carbide • fused aluminum oxide • electric furnace mullite • stabilized zirconia • boron nitride • boron carbide • zirconium boride • titanium boride • chromium boride • molybdenum boride • nickel aluminide.

Shapes . . . you can have any shape you need custom-built in Armstrong Insulating Fire Brick



Armstrong special shapes are extra strong . . . machined to extremely close tolerances with sharp edges and clean, unbroken corners. They can be made from any of the six standard types of Armstrong Insulating Fire Brick. Various sizes of refractory tile stock are maintained at the factory for fast service on large custom shapes.

Get free booklet on Armstrong Insulating Refractories by writing Armstrong Cork Company, 2701 Reed Avenue, Lancaster, Pa. Any time you're faced with a furnace lining or building problem, an Armstrong sales engineer will be glad to help you.

Armstrong INSULATING REFRACTORIES

Technical Outlook

MORE TO COME— Titanium sponge prices dropped from $5 to $4.50 a pound in 1954, but T. W. Lippert, manager of sales and technical service, Titanium Metals Corp. of America, says many trade observers look for even more significant declines in 1955. He pins the 1955 price cuts to the industry's continuation of its fast production and development pace and the exploitation of current pilot operations leading to the full recycling of scrap metal.

ADHESIVE HOLDS— An Army research report says that epoxide resin adhesive, Araldite 115, used in place of soft solder for bonding galvanized steel screens to cold-rolled steel shrouds in bomb tail fin assemblies may reduce the cost of the operation 50 per cent. Tensile tests of the resin after storage in desert, tropical and arctic conditions showed it to be equal in strength to soft solder under all three conditions.

HIGH-TEMP ALLOYS— Robert A. Lubker, manager, metals research, Armour Research Foundation, says vanadium-base alloys having a density of about 6 (iron is about 7.8) may provide a long-range answer to the problem of improved, elevated temperature alloys for aircraft frames.

TOUCHY— Workers at Letterkenny Ordnance Depot are reconditioning live bombs and shells which have become rusty and corroded. Shells are conveyor-fed through an American Wheelabrator & Equipment Corp. chamber and are blast cleaned with metallic abrasive.

ANSWERS NEEDED— Nuclear fission means the release of tremendous amounts of energy and the bombardment of materials by neutrons and gamma rays. Structures suffer severe thermal stresses. Removal of heat from the core of the reactor must be rapid to keep its temperature to a practical limit. These are problems the Franklin Institute, Philadelphia has in mind for its new research section on heat and power.

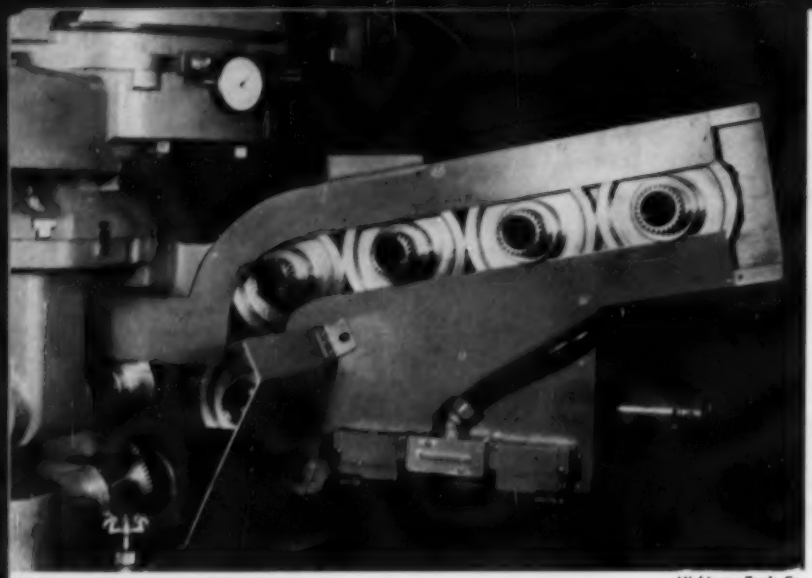
PLASTIC OUTLOOK— Production in reinforced plastics was high in 1954 (a million pounds better than 1953, says S.P.I.) but it didn't come up to expectations. One apparent reason for the lag is the absence of mass-production techniques for fabricating reinforced plastic products.

AFTER TINKERTOY— Still moving toward completely mechanized production of electronic components, the National Bureau of Standards announces three new items for automated assembly: An adhesive tape capacitor, an adhesive tape resistor and a carbon film resistor. They fall under "Modular Design of Electronics and Mechanized Production of Electronics" (MDE-MPE) or what used to be simply Project Tinkertoy.

SUN POWER— Solar batteries of silicon may someday be practical for furnishing household power, says General Electric. The sun-gathering area of the average house roof is more than sufficient, but the problem to be licked is finding an economical method of producing high-purity silicon on a large scale.

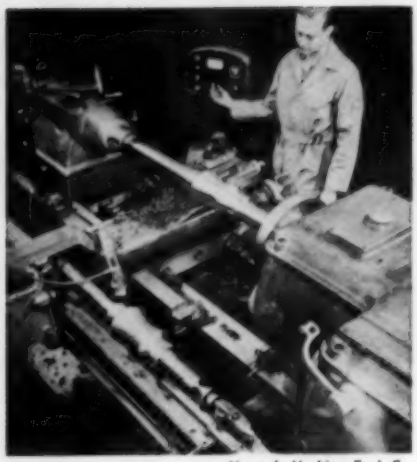
CHECKS FREQUENCY— A new "electric governor" controls the output of engine-driven generators by sensing variations in the output frequency and making the necessary corrections in the power source driving the generator. The heart of the supersensitive device, developed by Westinghouse Electric Corp. and the U. S. Army Corps of Engineers, is a magnetic amplifier.

Metalworking Outlook—p. 31 *Market Outlook—p. 111*



Michigan Tool Co.

Loading devices are being used on a wide variety of production machine tools. This one puts a new helical shoulder gear in position for shaving every 15 seconds. A sizing fixture rejects oversize parts. An air cylinder feeds the parts to shaving position



Monarch Machine Tool Co

Use of tracer-controlled contouring devices virtually eliminates the time taken to reset machine for diameter variations and shoulder positions. Accuracy also alleviates the problem of gaging and checking the part while it's in the machine. First piece can be used as the template

Automate Standard Machines

Both builders and users are gunning for the nonproductive time of the machining cycle. They'll use a variety of systems, but all have one goal—cut costs

By ROBERT F. HUBER
Machine Tool Editor

NOT LONG AGO a production supervisor sat down at his desk and examined some scribbled notes he'd made on a small pad. They represented a quick time study of a bottleneck machining job. The problem: Cycle time had to be cut —or another machine had to be added to the line.

The job was in no way unique. It involved finish turning several diameters, facing the shoulders and chamfering two edges. The part was a cylinder about 2½ ft long, 6 in. in diameter.

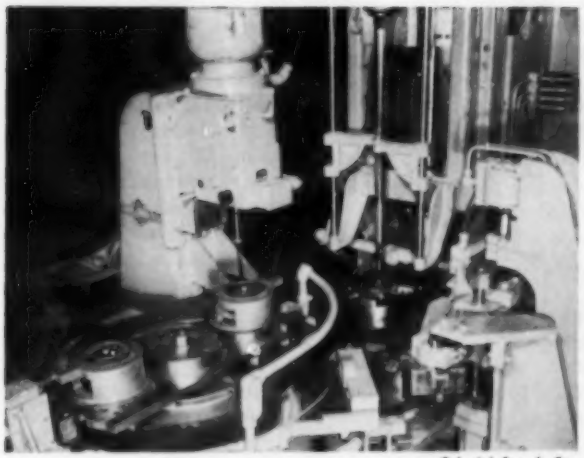
Indicative—The figures on the supervisor's pad pointed up the reason for what is perhaps the most important single trend in standard machine tool design today: Adding a touch of automation to the standard tools.

Here's how it figures. On hand-operated and semistandard machines, a majority of the cycle time often has been spent not cutting metal but operating the machine and checking its performance. While it is an essential part of machine production, it is, in essence, nonproductive time. Machine tool builders are trying to design this time out of the cycle.

Compromise—At the outset, they have to admit it can never be completely eliminated. Even in the 100-per-cent automated machining lines where the operator is a watchman, time must be allowed for the tools to advance and return and for the workpieces to advance from one operation to another.

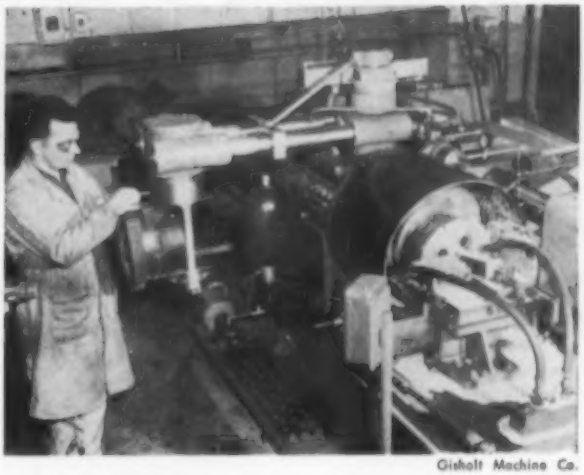
Any step, however, they can take in improving the efficiency of the machine cycle will lead to higher production on the machine, lower costs for the user and more machine tool sales. It will further obsolete the old machines in use.

Breakdown—To finish the story of the supervisor's notes, they showed that less then 25 per cent of the cycle time was spent cutting metal. The remainder was taken hoisting the heavy part out of the machine, hoisting a new one in, setting cutters, checking diameters with micrometers, scaling shoulder lengths and starting.



Colonial Broach Co.

Sprockets drop from the holders on the loading arm (left) onto the indexing table. Table carries part through three operations: Drill hole in web, broach keyway, and stamp mark on the sprocket. Production is 200 parts an hour. Finished parts drop onto a conveyor



Gisholt Machine Co.

Hydraulically-powered fixture swings to load heavy parts in a large lathe. It brought a 15 per cent increase in production. Rough piece is loaded on the arm during machining cycle—swings in to take finished part from the chuck, puts new one in place

stopping and shifting the machine for all these operations.

The original plans for reducing cycle time by higher-speed cutting were shelved temporarily. The cutting time could have been halved, with little actual reduction in total time for the job.

Answer—The solution for this particular job was the transfer of the operation to a machine which could use a tracer attachment. With the new cycle, the multiple (7) diameters are turned with one tool setting. Faces and shoulders are properly located and chamfering completed. What's more, the job is done within limits without any intermittent checking and measuring on the part of the operator.

Tracer attachments are only part of the complete picture. Clutches, brakes, speed changing mechanisms, feed selectors, tool positioners and work-holding devices all are up for revision or they already have been revised.

Do It Yourself—A sure sign that the builders are on the right track is the number of production men who, like the supervisor, are modifying their present equipment to get a better cutting-noncutting ratio in the cycle time.

Here, a word of warning must be sounded. The machine itself must be capable of in-tolerance production over the time of the production run. In many cases, the cheapest way out in the long run will be the newer, faster machine tool.

Starting Point — Much of the loading and unloading of workpieces often can be done while the machine is in operation. For example, heavy diesel engine cylinder liners are machined on a standard automatic lathe.

The loading device consists of two identical expanding mandrels on an indexing carriage. (On a turret lathe, the carriage would be the hexagon turret.) While one workpiece is being machined, the previously finished part is unloaded and a new rough part is loaded onto the mandrel. After the cuts have been completed on one piece, its mandrel expands, the work carriage traverses back and indexes the new workpiece into position. At the same time the finished liner comes out of the machine. The lapse of time between machining operations is less than 30 seconds.

The Key—In some cases, a system of automatic loading and unloading will make the whole operation automatic. Many broaching and drilling machines have an automatic cycle. Addition of a feed system can free the operator to operate several machines.

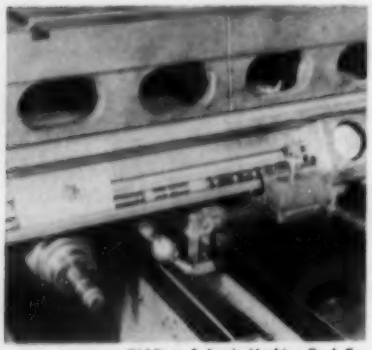
For example, a standard pull-up broaching machine was adapted to cut the splines in two models of a differential side gear. Gears are fed to four broaching stations on a conveyor which carries the work-holding fixtures.

Production—The conveyor takes the gears, four abreast, into the broaching position. After the gears have been broached the tools re-

The following companies co-operated in the preparation of this article: Colonial Broach Co., Detroit; Federal Products Corp., Providence, R. I.; Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.; Gisholt Machine Co., Madison, Wis.; Hydra-Feed Machine Tool Corp., Ferndale, Mich.; Lapointe Machine Tool Co., Hudson, Mass.; Lodge & Shipley Co., Cincinnati; Michigan Tool Co., Detroit; Monarch Machine Tool Co., Sidney, O.; New Method Steel Stamps Inc., Detroit; Norton Co., Worcester, Mass.; Seneca Falls Machine Co., Seneca Falls, N. Y.

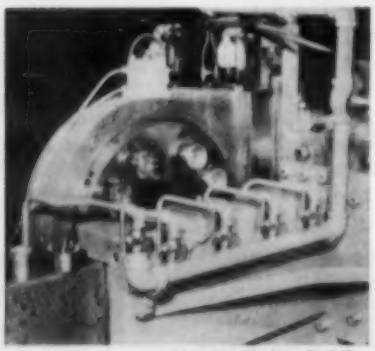
Federal Products Corp.

Electric gage, center, controls grinding cycle by checking diameter as it is ground. Finished part within tolerance is assured every cycle



Giddings & Lewis Machine Tool Co.

On resetting machine table locations, a simple gaging arrangement eliminates time-consuming checking and measuring. Operator can set to zero-reading on the gage or, as above, gage can be tied electrically to table feed



Lapointe Machine Tool Co.

Automatic broaching fixture carries rocket caps into work area. Parts are loaded in the eight-station fixture, two at a time. After first operation they are indexed 180° for the second operation. Parts are unloaded in the fourth position of the rotating fixture

turn through the gaps between workholding fixtures. A cycle takes 18 seconds—production is 800 gears an hour.

Finished pieces drop out of the fixtures into chutes. The complete cycle is automatic.

Contours—Where multiple surfaces must be machined, tracer-controlled methods may cut the job time by as much as 50 per cent. In effect, they can turn a standard machine tool into a production machine. They eliminate repetitive measuring of the work. Sometimes they preclude the need for complicated tools and cutters.

In some cases, the tracer mechanism can be tied into the machine cycle. At least one manufacturer offers a conversion package consisting of the tracer, an individual motor-driven feed and traverse return assembly, an electrical-control stand and stops for both directions of carriage travel. Changes in feed are made automatically as required during the cut.

Gaging—While much of the dimensional checking of workparts has moved up from the inspection department to the production line, the next step is to include it in the machine operation itself.

On grinding operations in particular, electrical gages are being used to give a continuous check to the dimension being machined. As the part size comes within limits for the operation, the gage automatically signals the machine control panel and stops the work cycle.

The operator is relieved of any periodic checking of the parts in process. Also, wheel wear and improper machine setting are taken into account. The cycle is geared strictly to the finished workpiece itself.

Self Correcting—On the same operation, an automatic wheel-truing device may eliminate as much as 30 minutes downtime. The automatic truing cycle can be started by pushbutton or by a counter built into the machine. The truing can take place during loading and may completely eliminate loss of productive time for the job.

Long List—These are only a few of the many ways production men are ridding their machine cycles of the nonproductive time. The full list would include such items as power-operated chucks, preset tooling and automatic, work-positioning devices.

Whole new operations can sometimes be added to a machining cycle. Milling and slotting can be done with attachments, for example, on automatic screw machines. This completely eliminates one operation with all the attendant handling and often can be done within the ordinary cycle time of the machine.

Ahead—Machine tool builders are betting their futures on the importance of the nonproductive time. One says his new machines, not yet announced, will "incorporate features to produce even greater savings in noncutting time." His new designs include fewer operating levers, better located to reduce operator time and effort; improved braking for faster stops; and quicker and more accurate speed selection through a patented calculator.

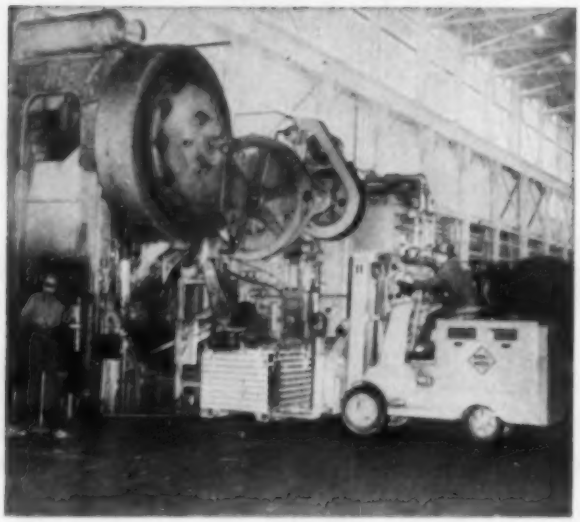
One of the most fundamental of the new developments will be the re-engineering of control levers and buttons. Functions which have been performed with a handwheel or crank will be regrouped and arranged to provide the operator with the most efficient combination possible.

All in One—A recently announced pendant control is typical of what will be done. Every machine function can be controlled from the pendant. Handwheels need be used only when the power is off. From the pendant the operator can select table speeds, directional rapid traverse and rate of feed for each head and can start and stop the machine.

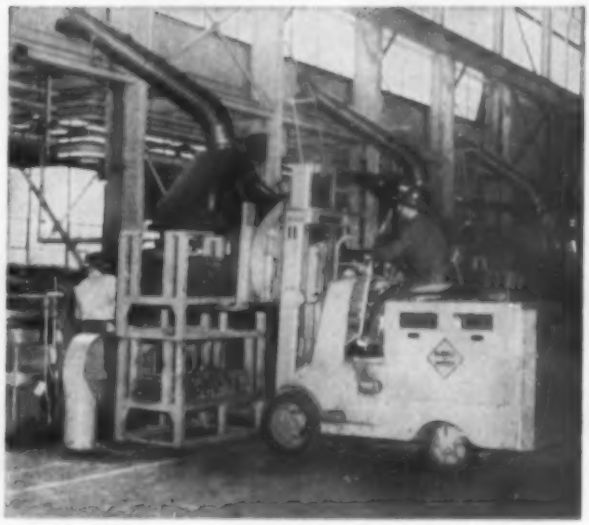
Instead of pushbuttons, the pendant utilizes miniature gear shifts. The purpose is to permit the operator to use one lever for all control of a single unit—let him work the pendant with his eyes on the part being cut.

Goal—As the machine tool user makes his bid for business in an increasingly competitive market, he'll look for higher production rates at lower costs.

Part of the answer will come with the new machine tools—redesigned by builders who also are bidding in a competitive market. But, as in the case of the supervisor's notes, much can be done with the machines and operations now in use.



After first forging operation, short lengths are conveyed back into skid boxes where they're picked up by fork trucks



After initial forging, longer lengths are placed in special tiering-type racks for convenient truck handling

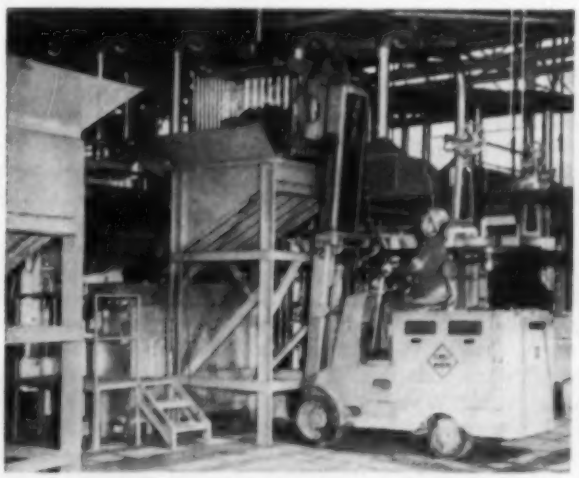
Bar forging is complete with production of disc-type end. From here, loads are trucked on steel skid bins

Forging Plant on Wheels

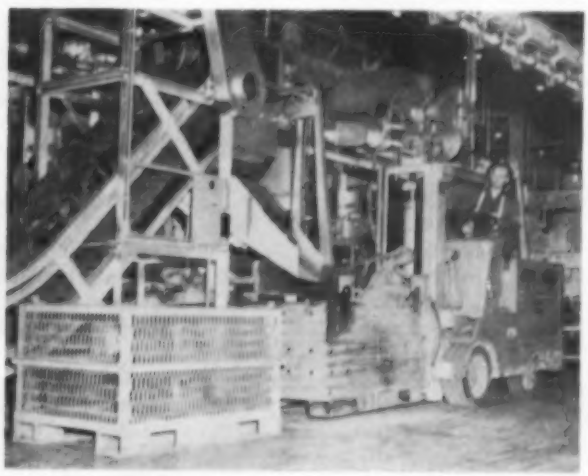
HANDLING is almost 100 per cent mechanized at Chevrolet Motor Division's new Tonawanda, N. Y., forge plant. Opened in September, the plant produces drive shafts, steering columns, steering bell cranks and other linkage, plus many other automotive forgings.

Backbone of the handling system is a fleet of Ellwell-Parker fork lift trucks (6000 and 8000-lb capacities). The larger vehicles are equipped with revolving heads to facilitate dumping bulk loads into gravity feed hoppers at work stations.

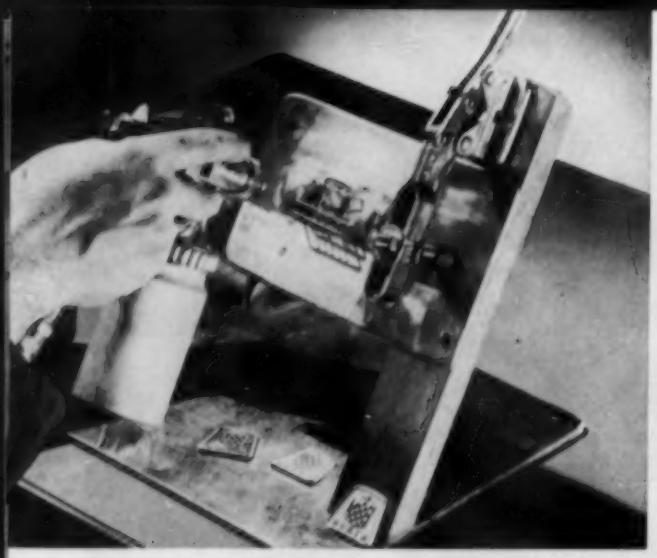
Integrating the operation, a system of short, powered belt conveyors transfer the forgings from the presses. Loads are discharged into skid boxes for truck pickup.



Smaller forgings are dumped by rotating-head trucks into gravity-feed hoppers that discharge into heat-treat furnace



After shot blasting, forgings are discharged automatically into skid bins, then trucked to inspection stations



Hand masks are simplest to use, but when work volume or part size increases,

Color Trim Fits Your Budget

It's not as expensive as you think to add that splash of color that gives your product eye-appeal. Electro-formed metal masks open the door to smaller-scale users

COLOR is playing an increasingly important role in creating consumer preferences. Yet too many manufacturers aren't taking advantage of this fact because they're sure they can't afford the added cost.

You don't have to be a high-volume producer to make it pay. Thanks to an electroforming process, the form-fitting metal masks can be made extremely accurate for practically any type of trim—and at a price within the reach of even the small producer. What's more, metal masks offer the advantage of repetitive use through thousands of painting operations without loss of accuracy.

How It Started—One of the leaders in the comparatively small field of mask making, Conforming Matrix Corp., Toledo, O., got into the business almost accidentally. Originally an electrotype platemaker for the printing industry, the company took on its first mask job as a favor to one of its customers. The venture was so successful that the new company was formed exclusively for this production.

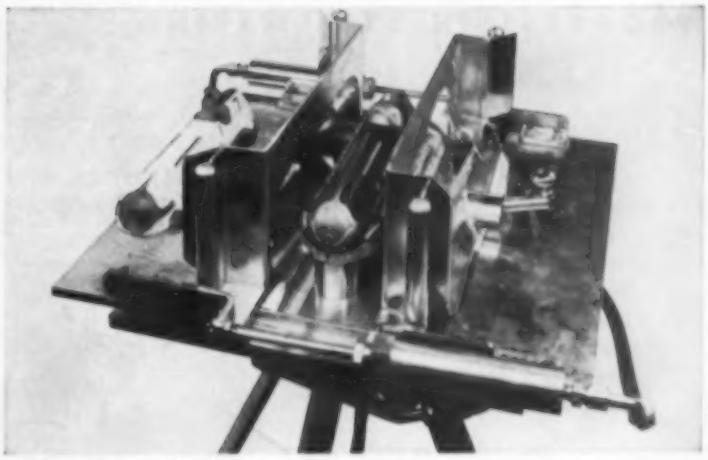
Using an actual production piece as the master, a wax mold is built around it, stripped off and then sprayed with a silver compound for electrical conductivity. Molds are then electroplated in copper to a suitable thickness. These are trimmed and routed out to form the desired masking which is then reinforced with wires and overhead bridging to support centers of letters and other designs. With this method, an exact reproduction of the production part is obtained, one that permits no overspray or leakage of paint

Four Types — To meet the demands of varying designs, four basic types of masks have evolved: 1. A lip mask for painting depressed contours while the rest of the part is shielded. 2. A lip mask for shielding a raised design while a depression background is painted. 3. A plug mask which completely shields depression contours while background is painted solid. 4. A block cut-out mask which confines paint to a small area around tiny depressions. With the latter type, a wipe or buffing operation removes all but the paint in the desired depressions.

How do you decide which type of mask? "Ideally, we like to consult with the client's designer on the matter of trim," points out Elmer Faber, chief engineer at Conforming Matrix. "Very often we can suggest minor design changes which will lend themselves to more effective masking, but most often we have to adapt one of the four types of masks to the job at hand."

Putting Them to Work—Perhaps the oldest form of painting with a mask consists of laying the mask over the part to be painted and spraying down through the mask to decorate required areas. Obviously this is not a fast, high-production method, but some companies use it to roller-coat color onto raised letters that protrude through a block cut-out mask.

For the widest variety of parts and at speeds of from 400 to 1000 pieces per hour, the hand mask is still the volume producer. With the mask clamped in a holder, operator loads and unloads pieces



horizontal, vertical or double-action fixtures speed up the job at low cost

with his left hand while the right hand operates the spray gun. As many as three different color sprays, using successive masks, can be applied to the part with but a single baking operation.

For Bigger Parts—When parts to be painted are larger than can be conveniently held by hand, it becomes necessary to use pressure fixtures of various types. These assure positive pressure and exact registration of the part in the mask. Obviously, they reduce handling fatigue, speed production and permit operator to use both hands for productive movements.

For the most part, pressure fixtures are air operated and so designed that they can accommodate several different sizes of masks with but little alteration. Three types of actions are available: Horizontal, vertical and double-acting. Air pressure is usually 30 to 50 lb and action is foot-pedal controlled. Restricted air flow on the inlet side simulates a hydraulic action when the part is pressed against the mask.

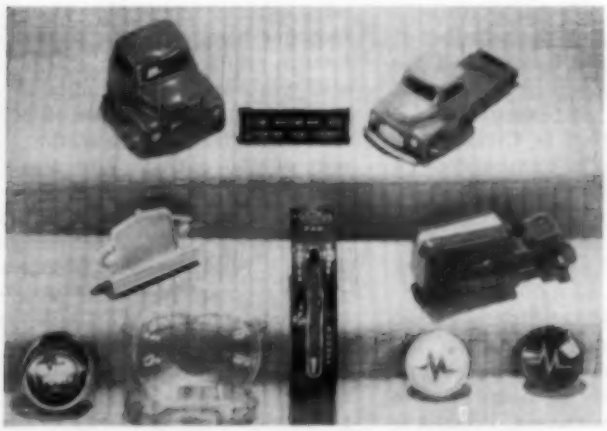
The horizontal fixture is best suited to parts with fairly shallow contours. But for parts with large areas and deep depressions where inaccurate removal from the mask would scuff painted areas, the vertical fixture is usually required. When the part is to be painted on all sides, the double-acting fixture closes two halves of a mask around it. This and the vertical fixture can be rotated 360 degrees.

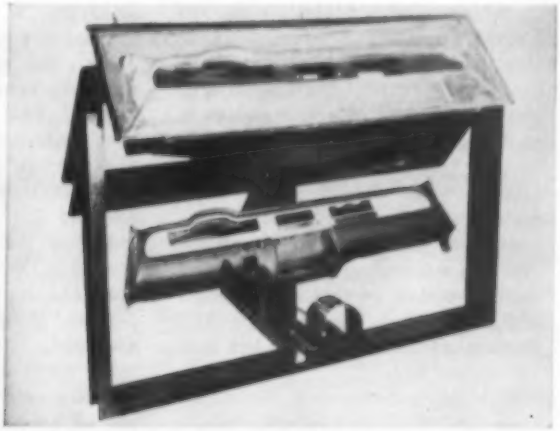
Completely Mechanized — In addition to the various hand and fixture applications, many jobs have been completely mechanized for extremely high production. Rotary indexing machines, where the operator does nothing but load and remove the painted parts are not uncommon.

Conforming Matrix has just marketed a $600 to $1500-machine which mounts the mask on a spring-loaded treadle. Operator merely presses the part into the mask which actuates either stationary or oscillating spray guns underneath. In one installation, the hand rate on a particular job was 200 per hour, but with the new machine the same operator turned out 1150 per hour. That particular machine paid for itself in 131 hours of operation.

Mask Washing — Because paint will clog masks after from 10 to 50 pieces are sprayed, (figure varies with intricacy of the mask) most production jobs require that three identical masks be formed. While one is in use, another is ready to replace it and the third mask is being washed in solvent.

Auxiliary to most fairly extensive masking jobs is the mask cleaning machine. Using either propeller agitation or pressure sprays, these machines can remove up to 25 coats of lacquer in as little as 20 seconds.





Most masking is done on fairly small parts, but it works well on big auto instrument panels too

They've come up with a foolproof system at Columbia-Geneva Steel that takes out the guesswork. Fifty different lubricants are coded now, and there's room for more

WHAT I WANT IS ABOUT A 20 WEIGHT OIL WHICH WOULD BE RIGHT FOR A PLAIN BEARING.
THATS EASY, YOU WANT THE BARREL THAT HAS THE GENEVA CODE M-325 STENCILED ON IT. BRAND NAMES ARE ALWAYS CONFUSING WHEN MORE THAN ONE SUPPLIER FURNISHES THE OIL
XYZ Oil
PDQ Oil
NRA Oil
M-325
UN Oil

By D. P. THOMAS
Lubrication Engineer
Geneva Works, U.S. Steel Corp.
Geneva, Utah

Lubricant Code Ends Confusion

WHAT with the many different types of lubricants used in and around a steel mill—and this number compounded by the many different brand names—getting the right ones for the right applications is vital. So the Geneva Works devised a code system that simplifies the job.

Each lubricant has an alphabetical symbol and numerical value which readily identifies its application limits. The coding system has been beneficial, too, in developing more than one source for a lubricant. Each supplier is required to stencil the Geneva code number on each drum head, no matter what other identification may already be shown there.

Mineral Oils—Oils assigned the "M" are mineral oils that may have oxidation and corrosion inhibitors and/or additives to meet the API Service requirements for MS and DG motor oils.

The Saybolt Seconds Universal viscosity (SSU) measurements are taken at 100° F for classifying the oils into grades. As an example, an oil with a code number of M-900 indicates a mineral oil with a viscosity of about 900 SSU at 100° F. Specifications for the oil will further identify the lubricant according to any additional qualities necessary to conform to the requirements covered by that code.

High Viscosity—Lubricants with a prefix "C" are high viscosity mineral oils with a compounding of ATO. The oil is viscous, and the viscosity measurement is taken at 210° F SSU. An example under this classification is C-145. The code indicates a compounded oil with ATO and a viscosity of 145 SSU at 210° F. The specification indicates the limits of the compounding with ATO, pour point etc.

Gear Shield Lubricants—These are trade name products, but the trade name has been accepted universally as meaning a lubricant to use on open gear teeth. Product is a viscous residuum product from the refinery operations and is cut back with an oil and such materials as soap or graphite. The prefix "R" has been assigned to indicate a residuum product; for example, R-350 indicates a residuum type gear shield with a viscosity of 350 SSU at 210° F.

The prefix "RF" indicates a residuum cut back with a highly volatile solvent that evaporates when exposed to the air. The solvent has been added to make the viscous product easy to handle in cold weather. RF-400 indicates a residuum fluid with a base oil content before the addition of the solvent of 400 SSU at 210° F.

Rust Preventives — Protective coating lubricants have been assigned the prefix "P" to indicate use as a rust preventive. Products of this type are frequently used as lubricants. They have a slight lubricating quality built into them.

It is not advisable, however, to rely on protective coating products to lubricate satisfactorily. They should be removed prior to opera-

a CMP cost cutting report

ON THIS SPRING STEEL PART

CMP COLD ROLLED TEMPERED SPRING STEEL *made it easier at less cost!*

BEFORE

This manufacturer of spring steel parts purchased annealed spring steel and processed it for desired temper preceding fabrication. Frequently problems of non-uniformity slowed down production. Often-times parts did not meet specifications--tolerances were too variable--fatigue tests would not meet requirements. It all added up to many costly rejects.

AFTER

These problems were given to a CMP representative for study and, after several discussions with CMP technical representatives, a new manufacturing procedure was established. Specific specifications were developed by CMP for each spring steel application and, after approval by the Customer, CMP then produced and processed tempered spring steel to each such specific specification. The manufacturer's previous problems of fabrication and tempering-in-process were eliminated and the manufacturer showed an improved cost on each such spring steel job, proving once again that it is worthwhile to utilize the CMP technical spring steel experience which is available to you at any time.

CMP . . .
WHERE YOU CAN GET SPECIFIC SPECS. FOR SPECIFIC JOBS

- LOW CARBON
- HIGH CARBON Annealed or Tempered
- STAINLESS
- ALLOY
- ELECTRO ZINC COATED

the Cold Metal Products co.

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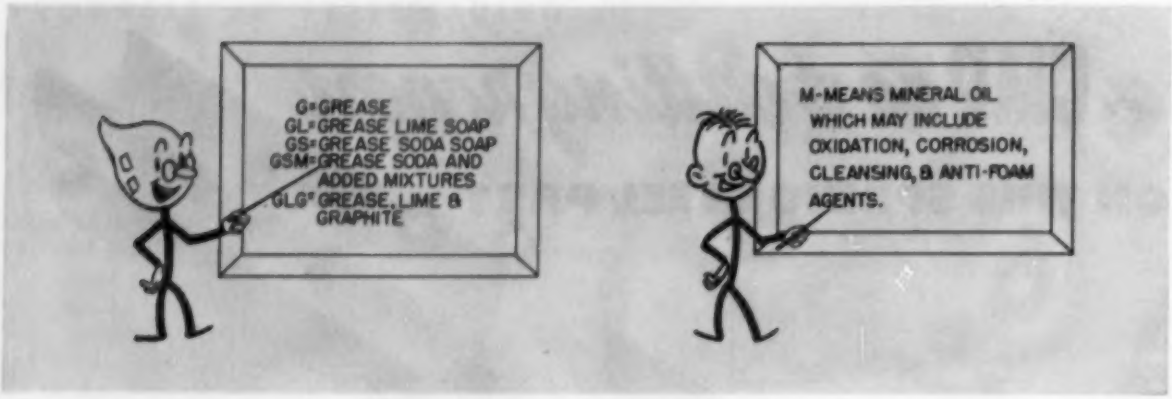
LOW CARBON, HIGH CARBON (Annealed or Tempered), STAINLESS AND ALLOY GRADES, ELECTRO ZINC COATED ARE AVAILABLE FROM:

THE COLD METAL PRODUCTS CO. OF CALIFORNIA
2131 South Garfield Avenue, Los Angeles — Phone: RAymond 3-4581

THE KENILWORTH STEEL CO., 730 Boulevard, Kenilworth, New Jersey
Phones: N. Y., COrtlandt 7-2427; N. J., UNionville 2-6900

PRECISION STEEL WAREHOUSE, INC.
4425 W. Kinzie, Chicago — Phone : COlumbus 1-2700


G=GREASE
GL=GREASE LIME SOAP
GS=GREASE SODA SOAP
GSM=GREASE SODA AND ADDED MIXTURES
GLG=GREASE, LIME & GRAPHITE
M-MEANS MINERAL OIL WHICH MAY INCLUDE OXIDATION, CORROSION, CLEANSING, & ANTI-FOAM AGENTS.

tion and a lubricant applied. A code number of P-400 indicates a protective coating that has a minimum penetration of 400 by the ASTM penetrometer.

Oil Coolants—Soluble and sulphurized cutting oils are denoted by the prefix "S." This class includes all soluble oils used as coolants, but cutting oils not emulsifiable but used for grinding or thread cutting are also included.

Viscosity measurements have little value since the oils are normally mixed with water, but the measurement is taken at 100° F SSU, with the oil before mixture as a means of standardization. S-150, for example, is a cutting oil with a viscosity of 150 SSU at 100° F.

Some Specials—The prefix "VM" indicates an oil with a tackiness additive to impart a stringy and an apparent viscous characteristic to the oil. An oil of this type is used to coat impingement type air filters. Viscosity of the base oil before addition of the tackiness agent is measured at 100° F SSU.

Initial letters "EPF" are assigned to an extreme pressure fluid. The fluid contains additives imparting extreme pressure characteristics and is used to lubricate gear sets operating under high loads, speeds and shocks. Types of pressure additives may be lead oleate, lead napthenate, sulphur-chlorine or sulphur-chlorine-lead. The code number EPF-130 indicates an extreme pressure fluid with a viscosity of 130 SSU at 210° F.

Viscosity measurement is taken at 210° F because some of the lubricants are viscous. The specifications of the EPF series should be studied thoroughly to choose the correct lubricant for the application.

Greases—Quality of oil and soap used in the manufacture of the grease is reflected in the lubricating properties of the finished product. The letter "G" is assigned to grease and any letter following the prefix "G" further identifies the grease according to the type of soap used in manufacture.

Consistency of grease is measured by the ASTM penetrometer and is indicated by the first group of numbers following the alphabetical symbols. The second group of numbers indicate the viscosity of the oil, at 100° F SSU, that was used in the manufacture of the grease.

Lime Thickeners—The prefix "GL" indicates a grease with a lime soap as the thickener. An example, GL 320-900 is a lime soap grease that has a penetration of 320 and a mineral oil viscosity of 900 SSU at 100° F. Lime soap base grease is used where operating temperatures are 170° F or below and in places where water is present.

Soda Thickeners — Soda soap greases have a prefix "GS" assigned, and the numerical values have the same significance as the lime soap grease designations for consistency and oil content. Soda soap greases are used under conditions of high temperatures 200 to 250° F. Soda soap greases are unsatisfactory for service where water is present because the soda soap is soluble in water.

Greases assigned the prefix "GSM" indicate soda soap grease primarily, but another ingredient may be mixed with the soda soap such as aluminum stearate, lime, etc. The lubricant will withstand moderate amounts of heat and water.

Factory sealed bearings normally are packed with high quality soda mixture greases.

Waterproofed — The symbol "GLG" denotes a lime base grease with graphite added. Addition of of graphite improves the lubrication under extreme conditions of water such as in hydraulic plungers.

Code GLG 235-350 indicates a grease consisting of a lime base with graphite added; consistency is 235 on the ASTM penetrometer and the oil viscosity is 350 SSU at 100° F. The specifications covering the grease govern the percentage of graphite added to the grease.

Extreme Pressures—The initial letters "EPG" form the prefix symbol for extreme pressure greases. This type contains a suitable soap stock for resistance to water and in some instances heat resistance. An addition of a lead soap or a sulphur-chlorine type combination may be used to impart the desired extreme pressure properties. The grease was designed for heavily loaded bearings such as work roll anti-friction bearings. The specifications should be reviewed before the selection of the extreme pressure grease.

There is a miscellaneous group under which all products are placed that have not been included under lubricant codes and specifications. The items carried in this group are specialty products and their use does not constitute a major consumption item sufficient to warrant specifications and a code symbol.

Eventually, all miscellaneous items will be classed under a definite code and specifications prepared to develop additional sources of supply.

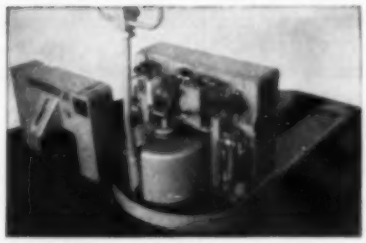
Make sure your maintenance man sees this!

Clark's POWRWORKER "26"*

The most "Serviceable" truck ever built!

POWRWORKER "26" Pallet Truck
4000 and 6000 lbs. capacity
Also available as platform or tilting fork stacker

Ask him to compare these ACCESSIBILITY features!



HYDRAULIC SYSTEM EXPOSED IN 2 MINUTES . . .

Remove 4 bolts and slip off the one-piece cover; the complete hydraulic sub-assembly is exposed. Hydraulic motor, pump, oil reservoir, valve assembly and self-aligning cylinders are immediately accessible and ample space is provided for quick inspection or removal.

POWER HEAD READY-TO-WORK-ON IN 2 MINUTES . . .

Split cover allows complete accessibility to the drive motor, brakes, resistor and control panel by merely removing 7 screws. Revolving head permits servicing any side of the power head without further dis-assembly. For major overhaul, the whole unit can be removed in 17 minutes.

CHANGE DRIVE TIRE IN 12 MINUTES . . .

Standard Press-on type demountable tire is furnished as original equipment. Raise the truck 12 inches and loosen spanner nut which releases the axle shaft and the wheel drops out. Split wheel rim with spreader inserts allow immediate tire dis-assembly and re-assembly.

*** The POWRWORKER "26" is only 26 inches longer than the load . . . the shortest standard truck on the market!**

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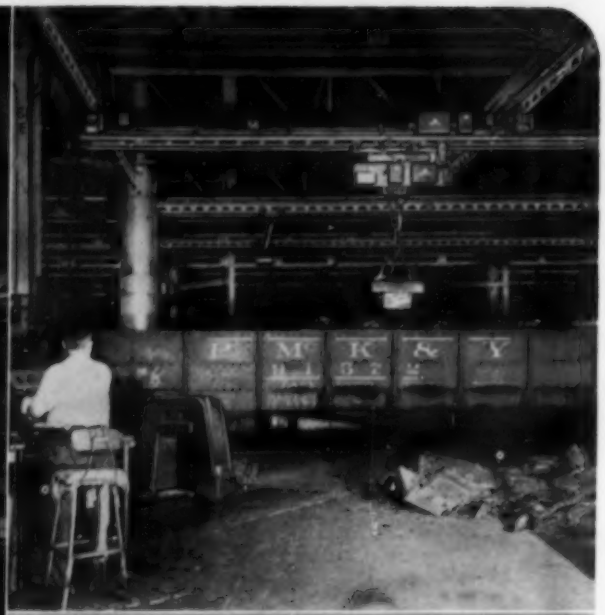
CLARK EQUIPMENT



Baled scrap is handled directly from baler to railroad car by the same crane.

Scrap from slat conveyor is dumped on floor at left. Crane with magnet then takes it to baling machine next to operator who operates all controls — crane, magnet, baler — from this one point.

CRANE HANDLES *ONE CARLOAD OF SCRAP* THROUGH BALER *EVERY TWO DAYS*

Both Crane and Baler Operated by One-Man Pulpit Control

SCRAP handling and baling have been made an extremely efficient one-man job at the Buffalo, N. Y., electric motor plant of Westinghouse Electric Corporation with a Cleveland Tramrail crane. Scrap metal is collected on a slat conveyor which extends some 300 feet under the floor, serving a number of punch presses. Near the baling department it is conveyed up an incline and dumped on the floor. Here a 3-ton, 3-runway magnet-handling Cleveland Tramrail crane takes over. It brings the scrap to a baling machine sunk in the floor. The scrap bales made here are placed into a gondola car by the same crane. The entire operation of crane and baling machine is controlled by one man seated at a pulpit, working with push buttons.

Bales measure about 10"x12"x18" and weigh an average of 300 lbs. From 300 to 425 bales are required to fill a railroad car depending upon car capacity. Approximately one carload is baled and shipped every two days, working two shifts (16 hours) a day.

Nearly every job involving materials handling can be made faster, easier, safer with Cleveland Tramrail.

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THE CLEVELAND CRANE & ENGINEERING CO.
7882 East 284th St., Wickliffe, Ohio

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

Trucks can carry three miles of aluminum pipe. This crew could lay it in 4½ hours

Aluminum Pipelines in a Hurry

Three men and a single pipe truck can lay one mile in 1½ hours. Thirty-foot lengths weigh only 30 lb, and a leak-proof fitting speeds the coupling operation

ALUMINUM PIPE for temporary oil, gas and water lines can be installed and picked up about 10 times as fast as other pipe of comparable dimension. This was proved in field demonstrations made in Austin county, Texas, where sizable savings in rig time, transportation and handling of pipe, laying and picking up lines, and other cost factors were effected.

In actual installations a mile of 2⅞-in. aluminum pipe, used because it is a standard size, was handled by three men and one truck. Average stringing and coupling time was 1½ hours, and average uncoupling and loading time was also 1½ hours. Total man hours were nine, and total truck time, three hours.

Special Coupling — The new development is based upon the use of seamless, extruded aluminum pipe, weighing less than one-eighth as much as steel pipe of comparable dimensions, with a special quick coupling. Coupling device is welded to the ends of the pipe sections to be joined, so that when the coupling is attached in the field a leak proof fitting is achieved.

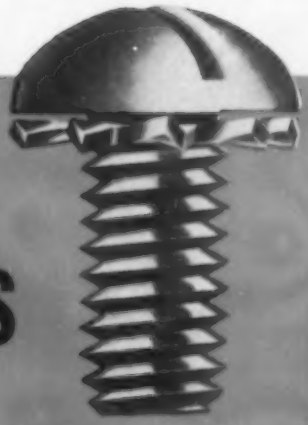
Gasket Seal—The coupling contains a split "O"-ring gasket on the inside, which seals when the coupling is latched in place. Savings with the aluminum pipe were found to result principally from lighter weight and speed in coupling and uncoupling. A 30-ft joint of the aluminum pipe weighs about 30 lb. Thirty feet of steel pipe of comparable dimensions would weigh more than 200 lb.

Equipment for the installation was from Associated Oil Field Rentals, a Houston firm. They purchased an initial shipment of approximately 45 miles of the pipe from Race & Race, Winterhaven, Fla., which developed the special coupling used. Reynolds Metals furnishes the seamless, extruded pipe to Race & Race and other firms which add their own coupling devices for quick installation and removal of the temporary lines.

One man can handle the coupling operation. The lug-ring joint locks the two ends and an O-ring gasket holds the 500-lb working pressure

the problem
the answer
Mr. Emerich Bechtold, General Foreman of the Heat Treating Department, and a Gulf Sales Engineer examine the Sems as they emerge from a bath of Gulf Super-Quench.

uniform hardening of SEMS



Gulf Super-Quench

The Shakeproof Division of the Illinois Tool Works had a quenching problem with "Sems" — the well-known screw and lockwasher combination.

Sems are assembled — the lockwasher fitted on the screw—then heat treated. Attaining uniform hardness with conventional quenching oils was difficult, however, because of the difference in size of the heavier screw sections and the normal variations of the steel. The change to Gulf Super-Quench resulted in more uniform hardening, even in the heavier sections, without any cracking of the lockwashers.

Just another example of Gulf Super-Quench's ability to get faster quenching without cracking and distortion, maintain uniform hardness, and cut rejects on many different types of steel parts.

Have a Gulf Sales Engineer help you discover opportunities to put Gulf Super-Quench to work—profitably—in your shop. Contact your nearest Gulf office today and have him call.

GULF

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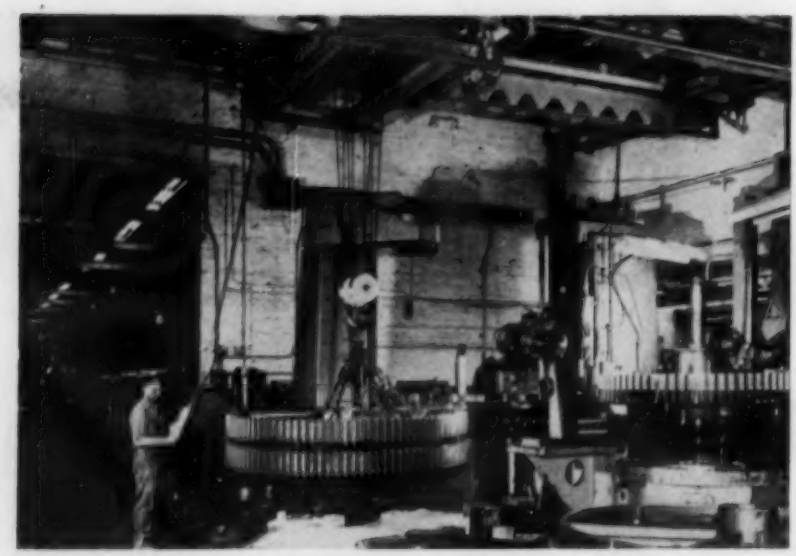
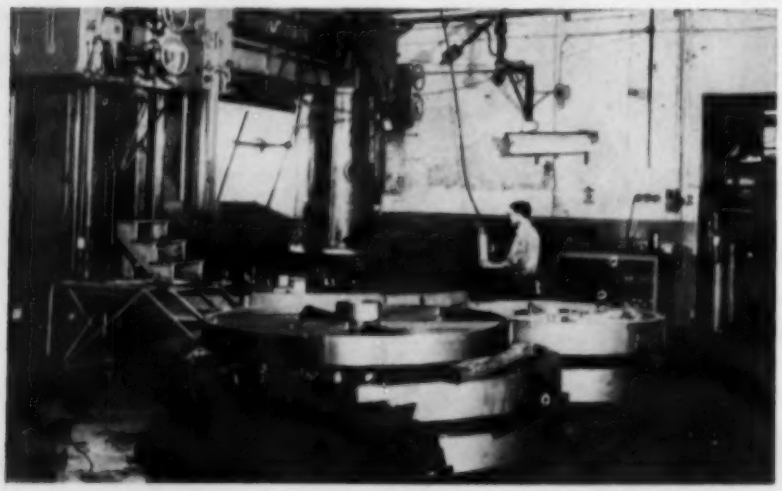
The finest petroleum products for your every need



A set of two 3-ton gears is lifted off the cutting machine with precision and safety by the machine operator

Now They're Cutting Big Gears, Too

Before they installed a couple of underhung cranes in their cutting room, Verson used to job-out a lot of the bigger gears. Machine operators now handle them with ease



In this instance, the crane is being used to position a 4-ton hydraulic cylinder in the vertical boring mill

AN UNDERHUNG, versatile crane system, permitting one-man, pushbutton control of loads up to ten tons, enables Verson All-steel Press Co., Chicago, to expand substantially its gear cutting operations so important to manufacture of the company's huge stamping presses.

Before setting up a bay to handle gear cutting and other jobs, Verson used another part of the building to handle such work as could be accommodated by a small overhead crane. Limited facilities made it necessary to job out much gear cutting work.

Not Now—Revision of the plant layout and installation of new machinery, including the handling system, now enables Verson to perform much gear work and other boring operations formerly done outside.

In setting up the new bay, Verson sought an overhead system rugged enough to handle heavy loads yet requiring a minimum investment in both equipment and installation costs. It placed in service two Whiting Trambeam cranes of 10 tons capacity each. One has a 32-ft span and the other has a 37-ft span. Combined, they provide complete area coverage of the bay.

Big and Small—The two cranes serve seven vertical boring machines and are in continuous use handling a variety of press components which range from small parts up to gear blanks of 120-in. diameter.

Operators of the vertical boring machines perform all handling incident to moving work to and from their machines. Bridge, trolley and hoist motion of each crane is controlled by pendant push button; the operator at all times sees exactly where his load is going.

A typical handling sequence for the Trambeam crane in the gear cutting bay involves the following steps: (1) Moving gear blank from incoming truck to temporary storage. (2) Lifting and transport of gear blank to machine for cutting. (3) Moving completed gear from cutting machine to temporary storage. (4) Lifting completed gear to outgoing truck.

Strikingly beautiful **color-chrome gas range** by Magic Chef, Inc., St. Louis, Mo.

Hydraulic press where door panels are formed. Left-hand die punches and forms; center die second-forms and trims excess metal, right-hand die final forms.

Punching and counter-sinking holes for handle and fastenings.

How Stainless Steel helps Magic Chef bring glamour into the kitchen

MAGIC CHEF'S new *color-chrome gas range* is an eye-catcher anywhere you see it—in the kitchen or on the sales floor. Highlighting the beautiful decorator colors of the porcelain enamel top and sides is a front of gleaming Stainless Steel.

There's real beauty here, but that's not the whole story. There's the durability of long-lasting Stainless Steel. And there's the ease with which Stainless Steel's smooth, dense surface can be cleaned—year after year.

This is the kind of sales appeal that Stainless lends to an almost countless list of products. And you can have it with surprising ease of fabrication (See "Fabricating Facts"). Put this appeal in your products, and when you do, follow the lead of successful fabricators who use service-tested USS Stainless Steel in the products they make.

FABRICATING FACTS

Compartment door, oven door and broiler drawer panels are fabricated from USS 18-8 Stainless Steel sheets, No. 3 finish.

Sheets are dry-coated with drawing compound, then sheared to blank size. Forming takes place in an hydraulic press, using three dies. Stainless Steel sheets form easily and without distortion in a die setup designed for carbon steel sheets.

Panels are paper-wrapped to protect against scratching; holes for fasteners are punched and counter-sunk. Dry-coating is removed; panels are sub-assembled and sent to the production line for final assembly.

See The United States Steel Hour. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

UNITED STATES STEEL CORPORATION, PITTSBURGH · AMERICAN STEEL & WIRE DIVISION, CLEVELAND
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO · NATIONAL TUBE DIVISION, PITTSBURGH
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
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USS STAINLESS STEEL

SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

UNITED STATES STEEL

"We've got this

says Joseph Asmonga,

UNITED STATES STEEL

heat treating down cold"

U. S. Steel Heat Treater

In the entire production of steel forgings, no single operation is more important or more finicky than the heat treating. Here, with careful heating and quenching, the forging is tailor-made to the physical properties you require.

At best, heat treating is a complicated business. And when you get into the giant forgings made at our Homestead Forgings Division, you encounter problems absolutely unknown in the production of smaller forgings. Only a handful of men in this country have the skill to do the job. One of them is Joseph Asmonga, a Heat Treater for 18 of the 25 years he has been with U. S. Steel.

Sheer *size* is a great problem and often makes liquid oil or water quenching impracticable. In the photograph, Mr. Asmonga is *air* quenching a roll arbor—and it takes him 10 hours just to reduce the temperature from about 1750°F. to 650°F.

Admittedly, Mr. Asmonga has an eye-popping array of instruments, furnaces and cranes to help him—as well as a complete metallurgical staff. But when you get right down to it, it takes plain old experience and skill to change a list of specifications into a finished, precisely heat treated forging.

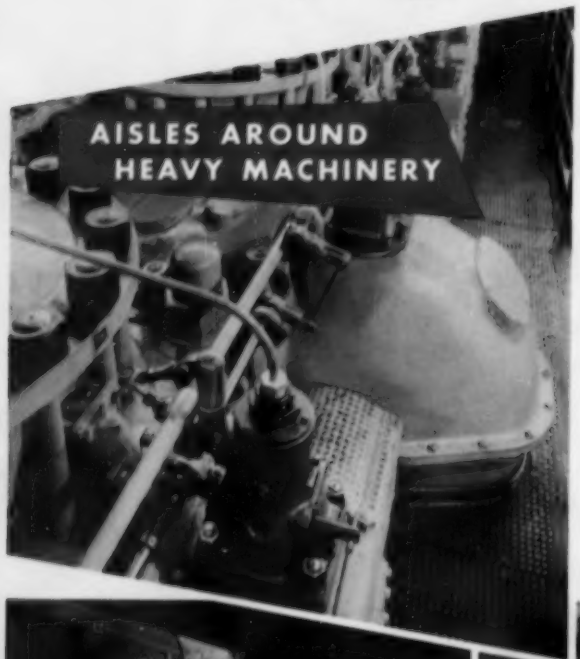
Joseph Asmonga is typical of the men who actually do the work on your U·S·S Quality Forgings. All of these men have the skill, the equipment and the *determination* to give you the finest steel forgings that money can buy. Write for more information and our free 32-page booklet describing U·S·S Quality Forgings. Address United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS

Quality FORGINGS

- heavy machinery parts—carbon, alloy, stainless
- electrical and water wheel shafts
- hammer bases and columns
- forged steel rolls and back-up roll sleeves

Have you *safe-treaded* all the danger spots in your plant . . . with Multigrip?



● USS Multigrip Floor Plate was scientifically designed to prevent accidents resulting from slips and skids. It'll pay you to look around *your* plant or shop for possible accident-prone areas that could be made safe with Multigrip. For it provides positive traction for feet and wheels at all times, from any direction.

Multigrip is comfortable to walk on, less tiring to work on because its "grip" risers are flat-topped.

Not only does Multigrip protect workers, but it protects floor surfaces too. It is rugged, heavy duty steel plate that will last for years without requiring any maintenance. (Multigrip does not chip, crack, rot or splinter as other flooring materials do.) And it's easy to keep clean . . . a quick "once over" with the hose or broom will get it spick and span. There are no niches to hold dirt; water drains quickly in any direction.

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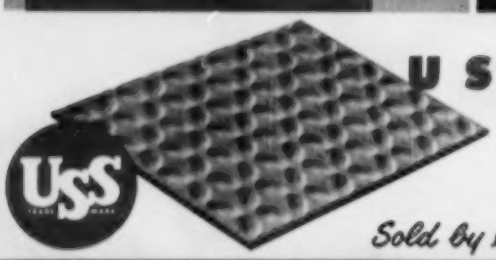

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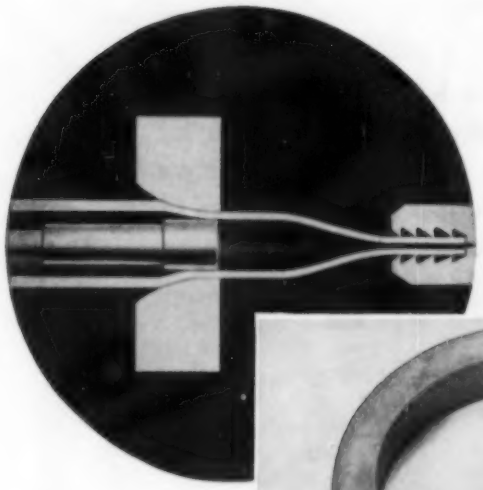


Mandrel showed 0.003 in. wear after drawing 75 miles of 1½-in. steel tubing

Carbide sizing ring is one of a set. Working on the bore of 5-in. rocket shells, this set lasted through 150,000 shells before it had to be replaced

Carbide roll is 5½ in. outside diameter, 1⅛ in. thick. It's used for burnishing railroad car journals at Missouri-Pacific shop, Sedalia, Mo.

Die Material Cuts Galling

The problem of metal pickup and galling or scoring is a serious one to metalforming men. Part of the answer may lie in the proper selection of die materials themselves

By C. R. RUTTER
Engineer
Kennametal Inc.
Latrobe, Pa.

SLIPPERY CARBIDE — that's what the personnel at an Eastern arsenal called their new die material when it showed no tendency to pick up metal and gall.

Galling had plagued them when they tried to taper 75 mm shell cases. The slippery carbide they referred to was our K82.

Ingredient—This material is part of the K80 series. Grades in this series contain $WTiC_2$. Their resistance to galling first came to light when they were used as steel-cutting tool tips.

When we first gave consideration to these grades for die applications, the idea came out that the nongalling properties would be a definite advantage, particularly in forming steel. Field results show their success on some tough jobs and indicate they are part of the answer.

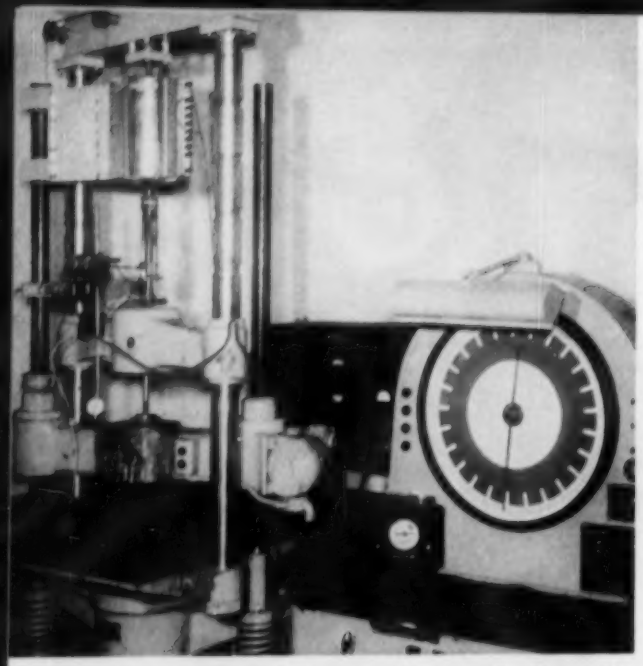
Cost Cut—Using a K84 mandrel, the Ohio Seamless Tube Co., Shelby, O., cold draws 75 miles of seamless steel tubing. At the end of that time, the mandrel shows only 0.003 in. wear. The average life of mandrels made from chrome-plated steel was only 500 ft of tubing.

Nib costs for drawing this 1½-in., SAE 1010 tubing, were cut from 40 cents to 1 cent per 100 ft. In addition, there is less scrap and less downtime for changing mandrels than was previously required.

Shell Bores — In another instance, a set of eight K84 sizing rings are mounted on a mandrel and are forced through 14-in. lengths of 1020 seamless steel tubing. The job is done at S & S Corrugated Paper Machinery Co., New York.

Tube lengths will become the body for 5-in. rockets. A 150-ton Bliss press exerts the 75 tons required to push the rings through at 200 sfm. A heavy lanolin-base oil is used as a lubricant.

The ring set produced 150,000 shells with wear amounting to a 0.010 in. reduction in diameter. A set of rings of another material ran only 60,000 shells with a 0.013 in. reduction in diameter.



Tensile tester uses strain pacer for reproducible results

Rumor has been throwing suspicion on titanium. Brittle behavior of a few grades in experimental jet engine tests has caused users to question all grades

By W. L. FINLAY, J. P. CATLIN, & D. W. KAUFMANN
Rem-Cru Titanium Inc.
Midland, Pa.

Titanium: No Time Limit on Toughness

HOTTEST unknown in titanium today is the behavior of the metal under stress.

By chance, Rem-Cru Titanium Inc., Midland, Pa., had on hand a group of titanium specimens which had been removed from creep tests prior to rupture. Some of these specimens had been under stress for as long as six years.

Remaining Strength—This gave us an ideal opportunity to determine their residual tensile ductility. We could get badly needed facts on the affect of combinations of time, temperature, stress and strain on the residual ductility or toughness of different grades.

These facts are needed now because titanium and its alloys are being used chiefly in jet engines and jet planes. Temperatures from −65° to 600° F and even higher, stresses up close to the yield strength, and periods of operation up to 1000 hours are common.

Unknowns — The big questions are: 1. Does titanium stay tough under these conditions? 2. If only certain titanium grades stay tough, which are they? 3. How does hydrogen content affect toughness?

Much testing in government and industrial laboratories is being devoted to answering these questions. Results come slowly because such testing takes time.

Test Requirements — For example, a typical test would include: 1. Creep testing to elongate the specimen 1 to 3 per cent over 1000 hours at the test temperature. 2. Pulling the creep specimen at room temperature and determining its residual ductility.

This is being done. But to get some over-all answers quickly, we examined all the titanium creep specimens Rem-Cru had stressed at Battelle Memorial Institute and Kure Beach during the past six years.

Alpha Titanium — Unalloyed titanium has an alpha hexagonal-close-packed structure at temperatures up to 1625° F. Above 1625° F, unalloyed alpha titanium transforms to the beta body-centered-cubic structure. Representative grades of alpha titanium are:

A-55—Alpha titanium of high commercial purity, having a minimum design yield strength of 55,000 psi.

A-70—Alpha titanium, a stronger commercially pure grade with a minimum design yield strength of 70,000 psi.

A-110AT—Alpha titanium with a minimum design yield strength of 110,000 psi and containing 5 per cent aluminum and 2.5 per cent tin.

Still Ductile — Residual tensile ductility after creep testing these grades is shown in Table 1. It can be concluded from the tests that residual ductility of all-alpha titanium alloys is not appreciably affected by combinations of: 1. Times up to 1600 hours (in one series up to 43,500 hours!). 2. Temperatures up to 1000° F. 3. Stresses sufficiently high to cause from 1 to 10 per cent creep elongation.

Notched stress-rupture tests have been run on A-110AT using an experimental test devised by Pratt & Whitney engineers. The specimen, (shown in the photograph) was loaded, usually at room temperature, and, starting from 10,000 psi, pressure was raised in increments of 10,000 psi with five hours duration for each increment.

A-110AT has an ultimate tensile strength in the range of 140,000 to 150,000 psi. Notched stress-rupture tests on specimens from 4 A-110AT ingots developed breaking stresses of 160,000 to 180,000 psi, testifying to tough behavior.

Alpha-Beta Alloys—When beta-stabilizing alloying elements like manganese, molybdenum, vanadium, iron and chromium are added to titanium, they stabilize some of the high temperature beta titanium down to below room temperature. A combination of alpha and beta titanium results. Representative combined alpha-beta titanium alloy grades are:

C-110M: Combined alpha-beta alloy with a minimum design yield strength of 110,000 psi and containing 8 per cent manganese.

C-130AM: Combined alpha-beta alloy with a minimum design yield strength of 130,000 psi and containing 4 per cent manganese and 4 per cent aluminum.

Residual tensile ductilities after creep testing of these grades are shown in Table 2.

Results — The tests show that residual ductility of combined alpha-beta titanium alloys is not appreciably affected by the combinations of:

1. For C-110M:
Times up to 1350 hours
Temperatures up to 600° F
Stresses sufficiently high to cause from 1 to 9 per cent creep elongation.
2. For C-130AM:
Times up to 1160 hours
Temperatures up to 600° F
Hydrogen contents up to 400 ppm at 220° F and up to 160 ppm at 400° F and 600° F
Stresses sufficiently high to cause from 2 to 14 per cent creep elongation.

Tough Behavior—In the 10,000 psi increment notched stress rupture test, specimens from 15 C-130AM ingots showed from 180,000 to 220,000 psi fracture stress.

In the one notched stress rupture test run at elevated temperature (592 hours at 600° F and 100,000 psi stress) no failure occurred and the specimen was removed.

These high values are evidence of the tough behavior of this alloy.

An Answer—What else do these tests say? Just this: It is completely unreasonable to tar all titanium with the same brush. These tests show there are grades of titanium with great residual toughness. This is a partial answer to those suspicious of brittleness in the wonder metal.

RESIDUAL DUCTILITY AFTER CREEP TESTING

Table 1—Alpha Titanium

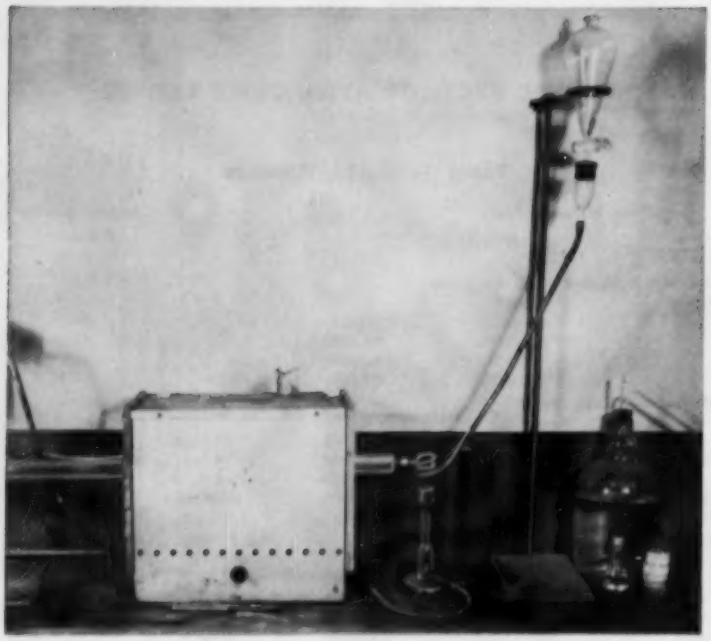
Conditions of Creep Test				Subsequent Tensile*
Temp. (°F)	Time Hours	Stress (psi)	Elong %	Reduction in Area, %
Five-year Half-hard A-70 Creep Test				
Atmos.	43,500	0	0	35.0
"	43,500	20,000	0	36.5
"	43,500	40,000	?	43.3
"	43,500	60,000	3.0	37.5
"	43,500	80,000	4.0	44.7
1950 A-70 Creep Test				
80	—	0	0	40.3-45.4
80	337-1385	40-65,000	1.23-10.6	41.1-46.5
400	700-1500	25-40,000	1.24-5.1	37.9-55.3
600	1000-1150	25-35,000	1.95-5.78	32.7-38.6
800	200-1175	8-20,000	.480-18.6	28.9-42.0
1000	1100-1640	3-4,000	1.1-10.8	29.7-41.0
1950 A-55 Creep Test				
80	—	0	0	45.1-54.3
80	970-1830	25-55,000	.2-17.7	43.1-57.9
400	750-1120	22-40,000	1.25-19	45.8-56.5
600	1020-1125	25-30,000	3.07-7.0	45.4-49.8
800	147-1125	6-15,000	.8-47.9	40.7-42.8
1000	1500	1150	.82	43.0
1953 A-110AT				
80	—	0	0	22.4
600	700	55,000	2.3	21.3

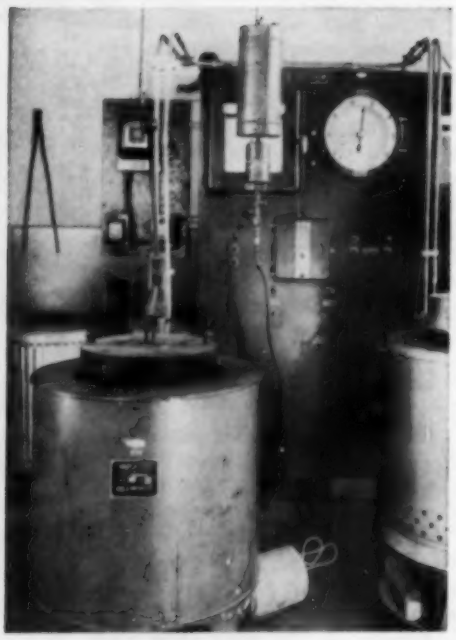
* Room Temperature

Table 2—Alpha-Beta Titanium

Conditions of Creep Test				Subsequent Tensile*	
Temp. (F°)	Time Hours	Stress (psi)	Elong %	Reduction in Area, %	Hydrogen Content**
1951 C-110M Creep Test					
80†		0	0	25.4-40.1	
80†	1010-1080	100-120,000	1.6-6.3	24.2-39.9	
80‡	1030-1350	90-117,000	3.2-6.75	31.0-37.5	
400†	1000-1200	75-102,000	.8-7.0	29.1-37.7	
400‡	940-1250	90- 99,000	1.9-5.3	33.5-38.4	
1953 C-110M					
80		0	0	29.7-39.9	
80	1080-1220	110-120,000	2.9-9.4	31.3-39.7	
200	750-1030	105-113,000	3.0-5.6	28.2-34.5	
400	700- 880	95-105,000	2.9-7.6	29.3-31.3	
600	500-1200	80- 95,000	2.3-7.6	25.8-31.7	
1952 Creep Tests on C-130AM					
80	1037	135,000	9.6	38.1	220
200	859	128,000	3.2	24.8	400
400	1170	120,000	14.0	39.9	160
600	1154	100,000	11.5	41.2	160
Summer 1954 Creep Tests on C-130AM					
80		0	0	34.3	
600	212	90,000	4.6	30.6	76
600	313	88,000	4.3	33.3	76
80		0	0	40.3	
600	575	90,000	2.7	38.4	10
80		0	0	33.9	
600	64	113,400	3.4	35.0	134
600	313	110,000	2.2	41.2	134

* Room Temperature
** Parts per million (100 ppm = 0.0100 weight per cent)
† Longitudinal
‡ Transverse





Simple atmosphere generating equipment: Left, copper coil and gas heater; right, 6-in. length of 2½-in. pipe surrounded by insulated Calrod unit

Alcohol Makes a Furnace Atmosphere

By MILO J. STUTZMAN
Senior Metallurgist
Midwest Research Institute
Kansas City, Mo.

TAKE ISOPROPYL ALCOHOL and water. Heat it. The result may be the heat treating atmosphere you are looking for.

Carbon monoxide, hydrogen and small amounts of carbon dioxide and water vapor are formed. If you use the right ratio of water to alcohol, you get a carburizing atmosphere that's easy to make and easy to control.

Isopropanol Best—To test the practical aspects of this idea, Midwest Research Institute, Kansas City, Mo., tried alcohols, ketones and aldehydes in water solution vaporized in a copper coil heated by a gas burner. Gases from the vaporizer were passed directly into a heat treating furnace.

Monohydric alcohols proved very satisfactory, especially isopropanol-water solutions. From them came atmospheres suitable for carburizing mild steel and for protecting medium and high carbon steels from decarburization.

It Works—With these alcohol atmospheres, low carbon steels have been case hardened and medium and high carbon steels hardened with surfaces remaining clean and free from decarburization.

With the higher concentrations of isopropanol used for carburizing, some carbon precipitated in the furnace in the form of a fine powder, but it did not coat the work or furnace walls. The aldehydes and ketones gave protection equal to alcohol atmospheres, but produced smoke and hard carbon on the work when used in carburizing concentrations.

Close Control—Positive control of furnace atmosphere is achieved by varying the alcohol-water solution. It's simply a matter of measuring the volume or weighing the constituents.

Furnace atmosphere can be changed easily. It's done by switching from one supply tank to another containing a different solution.

Gas Content—Atmospheres produced by alcohol-water solutions contain large percentages of hydrogen and carbon monoxide and low percentages of carbon dioxide, water vapor and hydrocarbons.

The following analysis is representative of an atmosphere produced from an isopropanol-water solution: CO_2—0.5 per cent, CO—27.2 per cent, H_2—68.7 per cent, CH_4—3.6 per cent.

It was obtained in a Leeds and Northrup 8-in. pot furnace operated at 1500°F, and was generated from 85 per cent isopropanol and 15 per cent water by volume. No water vapor condensed after the unit reached steady operating condition.

The vaporizer was a heated copper coil. Rate of flow was approximately 150 ml of solution per

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hour, equivalent to 9.3 cu ft of gas per hour.

Industrial Test — To evaluate this development under industrial conditions, tests were made in annealing furnaces of Sheffield Steel Corp., Kansas City, Mo. Material annealed was AISI C1035 bolt stock. A high percentage of spheroidized microstructure was desired.

A Lee Wilson furnace, which has a gas-tight inner chamber, was equipped with storage tanks for the alcohol-water solutions, valves to control flow and a vaporizing unit consisting of a gas heated copper coil. Gas was fed to the furnace through lines used for the regular atmosphere.

Results—Heats lasted approximately 14 hours with alcohol atmosphere used for approximately 12 hours. About 3 tons of steel were annealed at each of the 33 heats. Approximately 0.9 gal of isopropyl alcohol was used for each ton of steel.

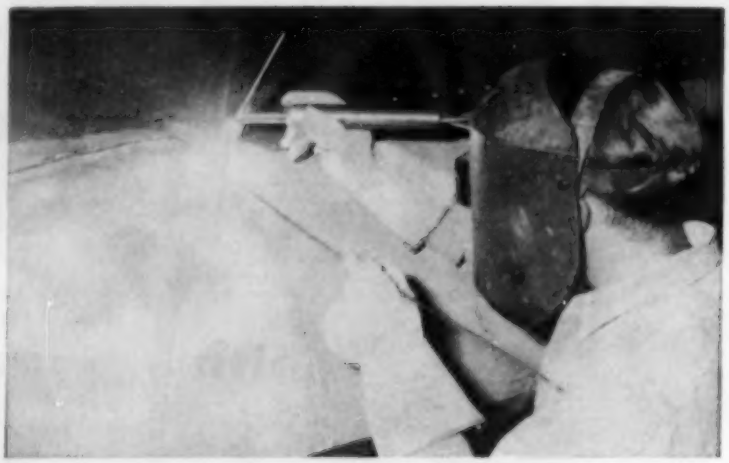
Although most of the test heats were operated and controlled by plant personnel to whom the process was new, results generally met specifications. A few heats under direct supervision of metallurgical personnel showed only 0 to 0.002 in. of free ferrite and 0 to 0.003 in. of affected area.

These test heats of C1035 steel show that an alcohol-water atmosphere, properly controlled, will prevent decarburization during annealing as effectively as any of the common atmospheres now available, and with cheaper equipment.

Advantages—Among advantages of alcohol-water atmospheres for heat treating are the simplicity and low cost of generating and control equipment. Storage tanks for the solutions, pumps if the tanks are below furnace level, valves and a vaporizing unit are all that are needed.

A generating unit to deliver 50 to 100 cu ft of gas an hour would cost between $2.00 and $4.00 per cu ft per hour capacity. Larger units would cost less.

Raw materials would cost between $1.50 and $2.50 per 1000 cu ft of gas. While this is higher than for gas generated from natural gas or charcoal, the alcohol-water atmosphere is composed entirely of active compounds.



Seams are braze-welded without flux. After welding, seams are ground flat and given a coat of priming paint

Braze-Welding Seals Zinc-Coated Roof

CORNERS on house trailer roofs present a touchy fabrication problem. It is being licked neatly at American Coach Co., Cassopolis, Mich., by Heliarc braze-welding.

Zinc-coated sheet makes a strong weather-resistant roof, but the combination of low-melting-point coating and high-melting-point base metal doesn't take kindly to ordinary welding techniques. A combination of argon shielded arc and Everdur rod gets around the problem nicely.

Technique — The ⅛-in. copper alloy rod is held almost flat in the weld joint and melted by the torch held at a right angle to the rod. High current provides enough extra heat to bring base metal up to temperature for good coalescence. Welding speed is about 60 ipm.

The weld is clean and spatter-free and requires only light grinding. One operator is able to braze-weld and grind about 200-ft of seams a day by the method.

CORRECTION PLEASE!

THE KEY was reversed on the hardness conversion nomograph printed on p. 70 of the Jan. 10, 1955, issue of STEEL ("Here's Help in Hardness Conversion"). Here is the way it should read:

A Brinell indention diameter (mm)
B Brinell hardness (10 mm tungsten carbide ball, 3000 kg load)
C Rockwell C scale
D Rockwell B scale
E Diamond pyramid hardness number, Vickers
F Shore scleroscope hardness number
G Tensile strength x 1000 psi

Clip out this revised key and paste it over the one in the Jan. 10 issue. Better yet, write Readers' Service, STEEL, Penton Building, Cleveland 13, Ohio, for a revised reprint. Request Hardness Conversion Chart. It's free in quantities of 5 or less.

NEW CO_2 METHOD Cuts Gas Cost 65% In T.I.G. Welding

for use with stainless and carbon steels

Dual inert gas enveloping the electrode is the secret. A new method developed by The Liquid Carbonic Corporation permits reduction of costly helium or argon gas to ¼ of present use. Low cost carbon dioxide gas makes up the balance of the protective atmosphere. Welding speed remains the same and high quality welds are retained with no change in electrical equipment.

You can use your present tungsten inert gas welding equipment. No new method for operator to learn. You can change over present welding equipment in a matter of minutes with Liquid Carbonic's low cost adapter kits. Mail the coupon below for additional information.

CO_2 Adapter Kits bring you savings of DUAL T.I.G. welding today

Kit consists of CO_2 regulator including flow meter, plastic hose, dual gas nozzle assembly. Fits HW10 Linde, H35A Airco, WG520A20 General Electric hand torches. (Also available for automatic equipment in near future.)

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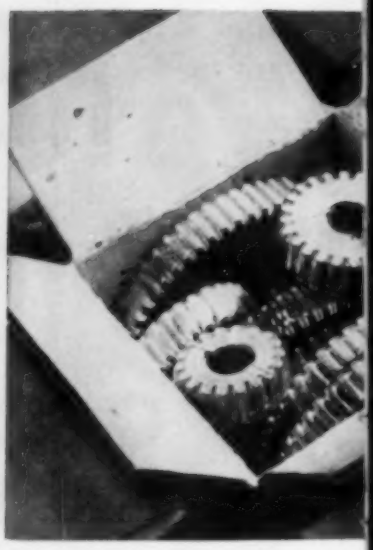
For single dipping, string tie method is easy. Nonwicking string should be used

Eastman Chemical Products Inc.

Numbers are taped on before dipping. Transparent coat keeps them readable



Bulk packaging requires only simple outer container

It's a package applied by dipping
It guards against hard knocks
You can see right through it
It blocks corrosion
You can use it over and over

Overcoat Keeps

IT'S PEELABLE PLASTIC.

During wartime a lot of companies became familiar with it as an armed services packaging requirement—2-million lb were used annually during the Korean war. But when military buying eased up, peelable plastic went into eclipse.

Now it is making a comeback on its own merits.

Protection Plus—It is being used to protect cutting tools, to package gears, to prevent damage during in-plant handling and to increase sales appeal. A manufacturer of electrical components adds color to the plastic and color-codes his products.

For those who have never used it, here's how peelable plastic works. Raw material is a high viscosity, high melting point, stable plastic such as cellulose acetate butyrate or ethyl cellulose. The part to be coated is first carefully cleaned. Then it is dipped in molten plastic for a few seconds, withdrawn and allowed to cool. The result is a tough transparent sheath 0.05 to 0.1 in. thick.

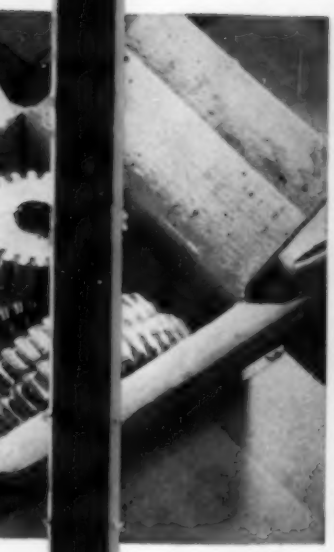
Tough Coat—The sheath resists impact and abrasion, but can be easily slit with a sharp stick and stripped away. It withstands temperatures from −40 to +225° F. It can be remelted and used over again.

Parts to be dipped can be held by a nonwicking string, can be hand held and dipped one half at a time or can be coated by pouring plastic over them. Drying time is about one minute. The only equipment required is a melting tank which holds the plastic liquid at about 350° F.

Corrosion Cut — The coating blocks corrosion in four ways: 1. The plastic is relatively inert. 2. It aheres closely so there is little trapped air. 3. It is relatively impervious to gases. 4. Oils in the plastic slowly exude to the inside surface where they act as rust inhibitors and parting compound.

There's no denying that peelable packaging costs more than masking tape or plain wrapping paper. But balanced against the cost differential are a combination of packaging qualities no other single technique offers.

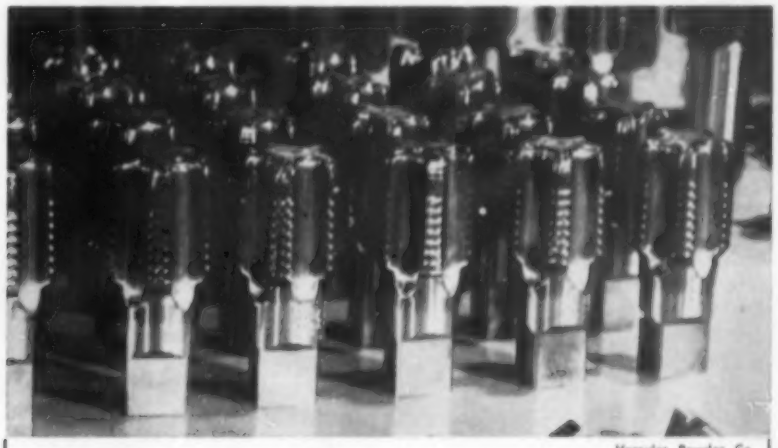
Why Use It? — Manufacturers shipping to humid climates should find it a natural. Because of its shock-resisting qualities, items can



To use a coated part, plastic is slit with a sharpened stick which won't scratch

Plastic is peeled away like banana skin. It may be saved, melted down, reused

Damage Out



Hercules Powder Co.

At Besly-Welles Corp., Beloit, Wis., taps wear plastic overcoats

be packed closely together. Here's a possibility for reducing package size, important in air freight shipments, Hercules Powder Co., Wilmington, Del., points out. Hercules makes an ethyl cellulose coating.

Carrier Corp., Syracuse, N. Y., is using a butyrate coating made by Eastman Chemical Products Inc., N. Y., to protect tools after grinding (80 per cent are carbide). When a setup of tools is packed in a tote box, there's no longer much chance that they will be damaged before use. Gages are coated, too.

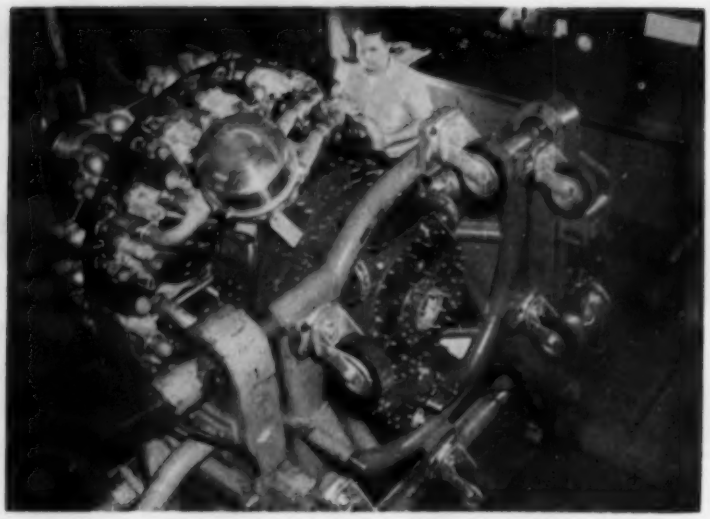
Pays Off — Carrier has figured the cost of regrinding chipped tools and refinishing corroded gages. At 60 to 75 cents a pound for the raw material, plastic coating wins.

For other uses, look right

PEELABLE PLASTIC PROTECTS THESE

- Bearings
- Brackets
- Bushings
- Cam shafts
- Connecting rods
- Cutting tools
- Fittings
- Flanges
- Gears
- Highly polished tools
- Knuckles
- Liners
- Micrometers
- Meters
- Milling cutters
- Motors
- Pistons & pins
- Precision tools
- Saw blades
- Shafts
- Spacers
- Sleeves
- Generators
- Starters
- Special gages
- Spiders
- Splines
- Tool parts
- Tube ends
- Valves
- Wrist pins
- Yokes
- Engraving plates
- Magnetic coils
- Surgical instruments
- Sewing machine parts
- Laboratory equipment
- Plating operations

Cradled in its test rig, the turbo-compound aircraft engine starts a multipurpose oil pressure and flow check. It's a good example of . . .



Testing and Cleaning on the Run

HOW MANY things can you do at once?

At one stage of inspection and testing on their turbo-compound engines, Wright Aeronautical Division, Curtiss-Wright Corp., Wood-Ridge, N. J., checks for oil leaks, tests rates of flow, assures free running of moving parts and guarantees the absence of chips and burrs inside the engine—all in a single test operation.

First Check—The 3250 to 3700 hp engine, (there are several models in this range) is first assembled in three sections. Each is tested on its own pressurized oil rig where gages, connected to various parts of the system, guard against circuit defects.

Test Cradle—Back on the production line the sections are put together for final oil-flow testing. The completed engine is positioned in a cradle-like rig. After being clamped upright in it, the engine is tilted hydraulically into a horizontal position.

Oil pressure lines are again hooked from the engine to the gages on the test panel. The driveshaft is coupled through a double universal drive to a 5:1 ratio standard Cone-Drive speed reducer that's driven through a clutch by an electric or hydraulic motor.

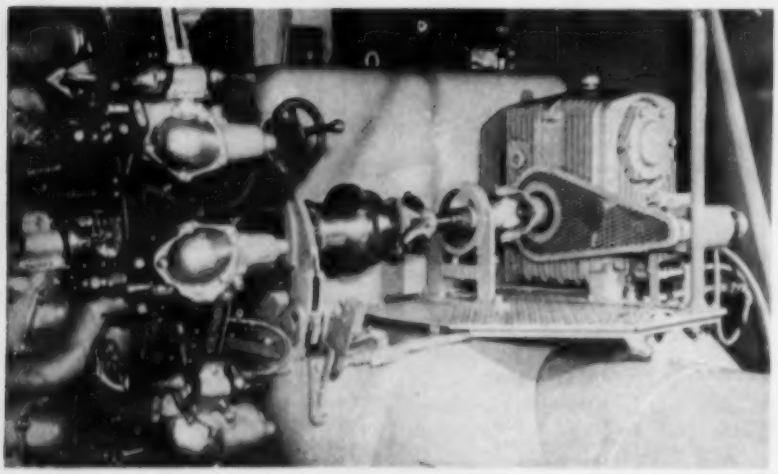
Contact—After oil lines are connected and the engine is coupled to the speed reducer, the operator presses a button on the control panel, starting a pump that forces heated oil from an underfloor reservoir through the engine.

First the engine is turned over with a slow-speed hydraulic motor for 2 minutes, after which it is declutched and a 100-hp electric motor takes over. Through successive stages the test engine is turned up to 960 rpm.

Differentials in oil pressures indicated on the test panel show the oil-tightness of the engine and measure oil flow for comparison with manufacturing standards.

As in the case of the component flow rigs, engine passages are continuously flushed as a supplementary protection against chips and minute burrs.

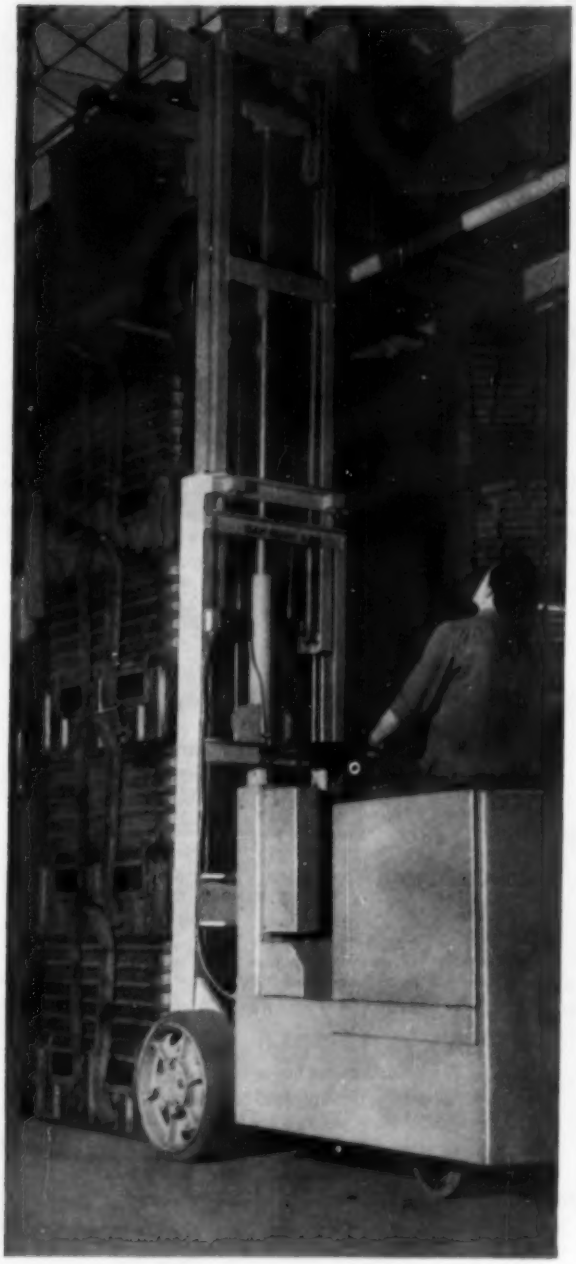
And More Testing—After this test, the engine is returned to a movable assembly stand, washed externally and given a 4½-hour power run. Next it's disassembled, the parts are washed and inspected. Not until it has been reassembled and gone through a final power run of 3½ hours, is it approved for delivery.



Double-universal joint connects Cone-Drive speed reducer to propeller shaft. Oil at 185° F and 30 psi is pumped into the engine

GET "FINGER-TIP" CONTROL, MORE LIFTS PER SHIFT

. . . with low cost Exide-Ironclad battery power!



ACCURATE STACKING, precise spotting, are essential for fast, safe materials handling. Exide-Ironclad Batteries respond instantly to any power need required for rapid, accurate handling operations. They enable trucks to handle as much load in the last hour of the shift as during the first . . . with no unscheduled down time. Lower costs for operation, maintenance, and depreciation make Exide-Ironclads the best power buy—AT ANY PRICE.

THE POSITIVE PLATES are the heart of any battery. Only Exide uses a slotted tube construction. By use of tubes, more active material is exposed to the electrolyte, providing *greater power.* Also, more active material is retained, *giving longer working life.*

THE NEW THRIFTY HAULER! The improved industrial truck battery. *Non-oxidizing* plastic power tubes assure longest battery life, more capacity in the same space. For full details, call your Exide sales engineer—write for Form 1982 (Installation and Maintenance of Motive Power).

Your best power buy . . . AT ANY PRICE! **Exide®**

IRONCLAD® BATTERIES

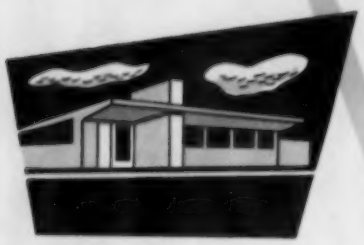
Exide INDUSTRIAL DIVISION, The Electric Storage Battery Company, Philadelphia 2, Pa.

MUELLER BRASS CO.

FORGINGS

ARE MADE TO LAST!

QUALITY PARTS AND PRODUCTS FORGED AND MACHINED OF BRASS, BRONZE AND ALUMINUM OR MAGNESIUM



IN THE HOME

IMPELLER DISPOSER

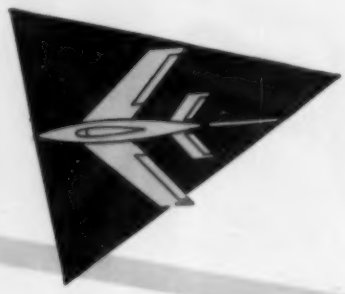
One of four Mueller Brass Co. parts in modern waste disposal unit. Completely dependable in daily operation.

WINDOW HARDWARE

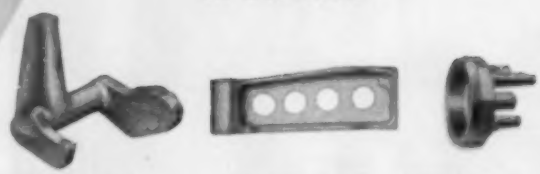
Forged of natural bronze. Can be furnished in aluminum or chrome finish as desired. Retains original beauty indefinitely.

BURNER HEAD

Forged of aluminum for installation in gas stove. Lightweight yet strong.



IN AVIATION



LANDING GEAR TORQUE ARM

SUPPORT MEMBER

INSTRUMENT HOUSING

These aluminum forgings provide the same strength as steel yet weigh only 1/3 as much. Smooth bright surfaces save machining time and eliminate costly finishing.

Specially designed forged housing for sealing diaphragm in aviation pressure warning unit.

IN INDUSTRY

CONNECTING ROD

Forged from "600" series metal. Over two million connecting rods produced without recorded failure.

ACTUATING GEAR

Forged from special Mueller Brass Co. alloy. Must take constant pounding.

AUTOMOTIVE GEAR

Forged of "600" series metal for use in automotive automatic transmission. Replaced part that was giving constant trouble; solved costly problem.

All Mueller Brass Co. forgings, of which just a few are shown here, have a dense, close-grained structure with a high tensile strength. Weight savings up to 40% are possible in the design of parts because of the close tolerances to which they can be produced. Less scrap and longer tool life result from the easy machinability of forged parts. Mueller Brass Co. is completely equipped to design parts for your products, specify alloys (including special alloys developed by our metallurgists), forge, machine, finish and plate the parts and perform all necessary assembly operations. Write today for our free illustrated 32-page forgings catalog and complete information about MBCo forged parts for your products.

140

MUELLER BRASS CO. PORT HURON 19, MICHIGAN

NEW PRODUCTS and equipment

Reply card on page 107 will bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue.

Variable Speed Drive Lathe with Back Gear Shift Lever

This 11-in. cabinet model variable speed drive lathe has a 24-in. capacity center to center and 1-in. collet capacity. Diameter of the hole through the spindle is 1⅜ in. The gear shift lever, within reach of the operator at all times, eliminates the need for using wrenches, pulling out pins, or opening guards to shift from direct spindle drive to back gear spindle drive, loose or locked spindle. The vari-speed drive offers a speed range of 44 to 1550 rpm. Speeds can be changed without turning of the machine.

The lathe is offered with a choice between 2¼ in.-8 threaded spindle nose and L00 long-taper spindle nose. The spindle is carried on two tapered rolled bearings on the inboard end and a floating sealed ball bearing on the outboard end. Rockwell Mfg. Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 1

Milling Machines Are Designed for Continuous Operation

The HyPowermatics are equipped with automatic two-way table feed cycles and infinitely variable feed rates. Designed for continuous operation on medium to larger size parts, cutting capacity has been increased to 50 hp and spindle speeds up to 2000 rpm. They will take conventional milling or climb milling cuts with either high speed steel or sintered carbide milling cutters.

Designated the 300, 400 and 500. series, they are built in plain and duplex styles in 42 sizes of each. The bed ways are long, hardened and ground to an accurate bearing with the sliding table. Ways are square gibbed and are provided with intermittent, dog-controlled automatic table cycles. Operating controls are conveniently and compactly grouped on the front right-hand side of the bed at working position. Cincinnati Milling Machine Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 2

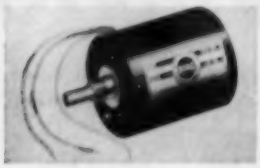
Stacker Provides Platform and Forks

For operations where both a platform and forks are required, the electro-hydraulic stacker is equipped with 30 in. long forks which handle 30 x 30 in. pallets. A platform 30 x 40 in. can be slipped over the forks when crated appliances, drums, dies or a man are to be raised.

The lifting height is 58 in. With a 1000 lb load, a lifting speed of 25 fpm is possible. Electro-hydraulic power is furnished by a storage battery with a built-in charger which charges from any lighting circuit. A single lever controls lifting and lowering. The stacker is ideal for work where both forks and platform are necessary, where usage is frequent and a fast lifting speed is required. Lewis-Shepard Products Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 3

Micropot Potentiometer for Commercial Applications



The series 1100 Micropot is designed for original equipment manufacturers of precision electrical devices who sell in a competitive market. The lead wires permit greater flexibility of application and ease of installation. Leads are 9 in. long, flexible and color coded for easy assembly. Rear shaft extension is optional for both single units and ganged installations.

The shaft is supported on two bearings at either end. Standard resistance values are from 50 to 100,000 ohms. They are available in independent linearity to an accuracy of 0.1 to 0.5 per cent. George W. Borg Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 4

Portable Saw Has 10-in. Diameter Blades

The Model 52B has a maximum cutting capacity of 3¼ in. A flat belt drive eliminates the ordinary gear drive with its attendant lubrication, costly repairs and replacements. The 1½-hp motor drives the 10-in. blade at 4000 rpm under load, cross cutting or ripping in hard or soft wood.

The saw can be adjusted for depth of cut from 1½ to 3¼ in. and to make angle cuts from 90 to 45 degrees. With the proper abrasive disc, it will cut stone, concrete tile, brick and other composition materials. The complete outfit includes the saw, combination blade, blade wrench and 15 ft of three-conductor cable packed in a carton. Syntron Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 5

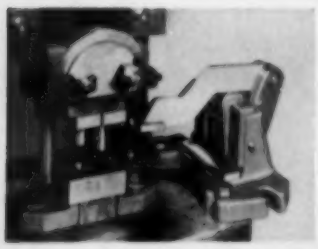
Devices Protect Machinery from Overloads

They feature high-friction, wearproof discs and an adjusting nut locking arrangement. Drive components can be mounted on the slip-type friction clutches. They act as automatic shear pin mechanisms. Any drive which requires overload protection is an ideal application.

The friction discs are an asbestos, phenolic resin and brass chip mixtures molded under high pressure. The limiters are available in 11 standard models having maximum torque capacities from 20 to 620 ft-lb. Outside diameters are from 2 to 3⅞-in. They can be mounted on shafts from ½ to 2½-in. in diameter. Model 445-1 (torque capacity of 50 ft-lb) is illustrated. Morse Chain Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 6

Scrap Chopper is Powered by the Press Ram



This compact chopper can be installed close to the die by means of two bolts. It is powered by the press ram completely independent of the die or tool. It operates with each stroke of the press. It can operate in and from any position on the press bed with scrap cuttings falling into a container. Thus, extra handling is eliminated.

The cutting blades are made of high grade tool steel and can be replaced in a matter of minutes. Grease fittings provide lubrication to all moving parts. Roller contact between strike plate and blades minimizes wear. The chopper is 6¼ x 4¾ x 9¼ in. Its capacity is up 3 in. width and up to 0.062-in. thick steel. Durant Tool Supply Co.

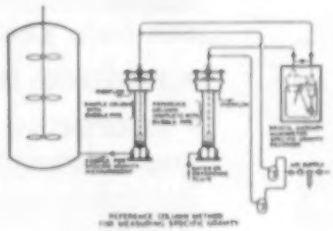
FOR MORE DATA CIRCLE REPLY CARD NO. 7

Gravity Meters for Liquid Solutions, Mixes, Slurries

These meters operate by comparing the pressure necessary to displace a given head of the sample liquid in a bubbler pipe, with the pressure necessary to displace an equivalent head of water. The instruments can be calibrated directly in appropriate units. They can be used for any liquid into which a bubbler pipe can be inserted. The meters are factory calibrated for liquid in question.

The meters use a mercury meter body, with or without counterpoise, and a standard Bristol series 500 recorder. The recorders can be equipped for automatic control of the specific gravity in any of the 5 control models. Bristol Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 8

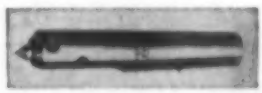


Centers Have Replaceable Carbide Tips

The Grip-Tip centers consist of a holder and a replaceable tip. The holder is tool steel and is available in several standard Brown & Sharpe, Morse and Jarno shank tapers. Tips are available in ¼ and ½-in. diameters. They are accurate to 0.0005 in. Specials can be furnished. An adjustable screw in the shank of the holder positions depth of tips in holder.

Only dull or chipped tips are reground, extending the life of the holder. Because the steel holder is not ground when sharpening carbide tip, there is less clogging of diamond wheels. Design allows regrinding at a central location. Detroit Reamer & Tool Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 9

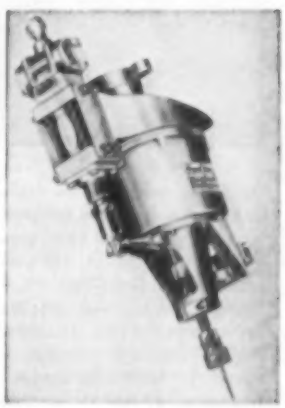


Lead Screw Tapping Head Is Automatic

Fully automatic or semiautomatic lead screw tapping on any drill press is featured in the Auto-Tap heads. They use standard Bellows air motors and Electroaire valves for activating the clutch mechanism. A fixed return microswitch impulse completes the cycle. The starting impulse can be arranged to suit the user's needs. The lead screw is said to assure production of perfect theads consistently in any material. It takes all end thrust and guides the tap. Tap breakage and work spoilage are reduced. A positive mechanical depth control permits blind holes to be tapped safely and accurately.

The heads attach to the quill of most standard drill presses. They can be used as tapping stations on standard or special purpose production machines. Model 800 tap sizes are: No. 0-5/16-in.; Model 900, No. 10¾-in. Automatic Methods Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 10



Lathe Has Ball Bearing Headstock

Model 750 has a runout of less than 0.0001 per ½ in. from headstock. It is equipped with a lever collet closer, v-belt, 6-position turret and double compound slide rest with rack and pinion cross slide. The front tool post wings 360 degrees.

Specifications: Over-all length 24 in.; 22-in. bed; swing over bed 2.953 in.; swing of lathe 5.905 in. Spindle speeds, with 1:1 pulley ratio, are 590 to 4700 rpm; with 2:1 pulley ratio, 1180 to 9400 rpm. F. W. Derbyshire Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 11

Norgren

MICRO-FOG LUBRICATION

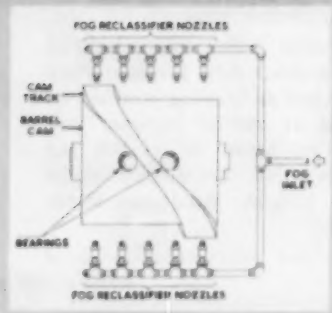
can help you

- **reduce machine wear**
- **increase bearing life**

Here's what Micro-Fog did for UNIVERSAL MATCH CORP. on 6 large printing presses

- **eliminated flaking and galling of cam track**
- **eliminated heating and excessive wearing of bearings**
- **eliminated constant squealing of barrel cam**
- **eliminated daily manual lubrication**

Oscillating movement of table on the printing press is achieved by a 16" dia. barrel cam rotating at 150 rpm. A Norgren Lubro-Control Unit (Filter, Regulator, Lubricator) was installed to lubricate the cam, cam track and follower roll bearings. It solved the lubrication problem so successfully that similar units were installed on the other five presses.



Two ¼" pipe lines, 18" long, carry Micro-Fog to 5 reclassifiers on each side of barrel cam. 10 psi air pressure used. Solenoid valve coordinates lubricant flow with press operation.

FOR COMPLETE DETAILS WRITE FOR NORGREN BLUEPRINT No. 118

C. A. Norgren CO.
3412 So. Elati, Englewood, Colo

VALVES • FILTERS • REGULATORS • LUBRICATORS • HOSE ASSEMBLIES

NEW PRODUCTS and equipment

Alloy Steel

. . . high impact resistance

High initial hardness (470-520 Brinell, as shipped) is combined with high resistance to impact. Wearpact has the ability to withstand abrasion and the toughness to withstand impact. This initial hardness is retained in sections up to 6 in. thick, with only a slight reduction in thicker sections.

Physical properties include a tensile strength exceeding 220,000 psi in the normal range of 470-520 Brinell hardness. Yield point exceeds 180,000 psi, making the material highly resistant to flow and distortion. These values are retained at operating temperatures ranging from 450 to −50° F. Charpy impact values are about 20 ft-lb. American Steel Foundries

FOR MORE DATA CIRCLE REPLY CARD NO. 12

Industrial Truck

. . . handles bigger loads

Models come with either standard gasoline or liquid propane (LP) engines and can handle all attachments used by Automatic industrial trucks. They are identical in design and engineering to the 4, 5 and 6000-lb Dynamotive trucks. This model provides 7, 8, 9 and 10,000-lb capacities.

The electric, infinite step transmission has no mechanical connections from engine to drive unit. This eliminates transmission gears and the need for hydraulic torque converters or overdrive mechanism. This transmission provides fully controlled power and an infinite acceleration range with minimum power loss. With no mechanical linkage between engine and wheels, transmission shock loads to the engine are entirely eliminated. Features include a full-size bench-type seat, extra leg room, centralized controls and the grouping of all instruments on the steering column. Greater safety, increased vision from the driver's seat, and accessibility of engine also result from design and styling factors. Automatic Transportation Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 13

FREE LITERATURE

Catalogs and Clip Sheets

Use these reply cards to bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue.

Cranes

Whiting Corp.'s "How to Select an Overhead Crane" is designed to help prospective crane buyers analyze their handling problems, decide on the type of crane desired and draw up specifications sheets for crane proposals—Unit 79, 7 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 14

Metal Cleaning

Metalwash Machinery Corp. offers "What You Should Know About Metal Cleaning." Types of cleaners, cleaning prior to painting and plating are covered—12 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 15

Metal Finishing

Carborundum Co.'s "Abrasive Grain and Powders" includes informative charts and illustrations to give you their latest abrasive engineering recommendations. Booklet No. 14, 42 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 16

Threading Heads

Landis Machine Co.'s "Solid Adjustable Threading Heads" includes detailed data on all its solid adjustable heads. They feature tangential chasers and cover a pipe range from ⅛ to 6 in.—Bulletin F-78-3, 7 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 17

Transformers

Westinghouse Electric Corp. uses Trans-Vision pages to explain all design features of a new line of distribution transformers — Booklet B-6403.

FOR A FREE COPY CIRCLE REPLY CARD NO. 18

Ledger Posting

Remington Rand Inc. covers automatic ledger posting on punched cards at a high speed on its Line-finding Posting Interpreter—Folder TM-808, 6 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 19

Silicones

Dow Corning Corp. gives evidence of the important part silicones play in product improvement and production economy—7 pages.

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Trade Waste

Hardinge Co. Inc. describes its line of equipment for water, sewage and industrial waste treatment —Bulletin 35-D, 18 pages.

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Aluminum

Aluminum Co. of America's "Aluminum in the Process Industries" outlines the economic and technical advantages of aluminum used in processing equipment for chemical and material storage and for transporting liquids—8 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 22

Blanking Presses

Waterbury Farrel Foundry & Machine Co. details its WF blanking presses (300 to 900 rpm range). Illustrations show the units from various angles, plus close-ups of design details—Circular No. 915-N-2, 8 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 23

Machine Tools

Sheldon Machine Co. Inc. illustrates and describes 18 machine tools. Complete information and specifications on lathes in production are included—24 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 24

Employee Training

Wheeler Associates Inc.'s "How To Train" deals with the training plant and supervisory personnel—Vol. 4, 8 pages.

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Pumps

Ingersoll-Rand Co. describes its vertical multistage pumps. Sec-

For free literature, editorial clips or more information on products described in this section, circle the corresponding number at left. Fill in box below for articles or advertisements not numbered.

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PRODUCTS MANUFACTURED _____

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5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
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tional drawings, dimensions and installation views of the pumps in service are included—Form 7096, 12 pages.

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Flow Meters

Bailey Meter Co. discusses the measurement of the flow of liquids where solids are suspended in the water supply and in waste treatment applications—Bulletin M22-5, 12 pages.

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Turbines

General Electric Co. describes its combustion gas turbines for power generation and mechanical drive—GEA-5516B, 28 pages.

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Welding Variables

Lincoln Electric Co. offers "The Effect of Welding Variables on Hardfacing Deposits." It gives full treatment of the two most important procedure variables in hardfacing—5 pages.

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Reamers

DoAll Co. covers describes its precision-ground reamers. Specifications are given in handy chart form—8 pages.

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Fans

Bayley Blower Co. provides selection tables from which the correct fan for the required capacity can be determined—Bulletin EX-531, 26 pages.

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Precision Face Grinders

Besly-Welles Corp. describes and illustrates a new concept in precision face grinders, the radial head grinder. Diagrams and performance data are shown. Bulletin 700, 20 pages.

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Worm Gear Sets

Foote Bros. Gear and Machine Corp. offers data for its standard worm gear sets—Engineering Manual SW No. 1, 23 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 33

Tools and Blanks

General Electric Co. offers latest prices and specifications on standard tools and blanks in its 300 series steel cutting carbides, grade 350 and 370—GT-305, 16 pages.

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Safety Equipment

E. D. Bullard Co. gives complete information on all its products. Easy-to-read technical data are supplemented with photos of items —Catalog #55, 19 pages.

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Rubber Material

Automotive Rubber Co. Inc. details ARco-CEL (a closed-cell natural and synthetic sponge rubber. It is adaptable to a variety of purposes—4 pages.

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Stair Treads

Dravo Corp. describes its line of Tri-Lok interlocked and Tri-Forged welded grating and stair treads—Bulletin No. 1105, 16 pages.

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EDITORIAL REPRINTS:

Automate Machines

Builders and users of standard machines are gunning for the nonproductive time of the cycle. They'll use a variety of systems, but they all have one goal—to cut costs, p. 72.

FOR A FREE COPY CIRCLE REPLY CARD NO. 38

Lubricant Code

Columbia-Geneva Steel has come up with a system of lubricant coding that ends confusion. Fifty different lubricants are coded now and there's room for more, p. 78.

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Color Finishing

Color is playing an increasingly important role in creating consumer preferences. Electro-formed metal masks are putting the price within the reach of even the smallest manufacturer, p. 76.

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Proxy Fights

Many of the recent rash of proxy fights have been staged in the metal-working field. The counsel of management experts on the problems of keeping your stockholders happy while running a successful business will be found on p.42.

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1	11	21	31	41	51	61	71	81
2	12	22	32	42	52	62	72	82
3	13	23	33	43	53	63	73	83
4	14	24	34	44	54	64	74	84
5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
9	19	29	39	49	59	69	79	89
10	20	30	40	50	60	70	80	90

1-17-55

For free literature, editorial clips or more information on products described in this section, circle the corresponding number at left. Fill in box below for articles or advertisements not numbered.

ARTICLE OR ADVERTISEMENT	PAGE

NAME _____ TITLE _____

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ADDRESS _____

CITY AND STATE _____

This Card Must Be Completely Filled Out. Please Type or Print

INDUSTRY GEARS FOR HIGHER PRODUCTIVE STANDARDS

C.P.C.* helps GENERAL ELECTRIC increase the pace

With rising labor and material handling costs in the production of refrigerator compressor housings, General Electric presented their problem to C.P.C. – Clearing Productivity Consultants. The result is the transfer-feed press shown above to produce top and bottom halves of the compressor housing at the same time. This press replaces a conventional method involving several machines, a crew of men and considerable handling of material.

The new transfer feed press loads blanks into the stock feeder and automatically moves the parts from station to station as the press operates. Top and bottom halves of the compressor housing are completed in alternate strokes by the red slide shown in the photo. From there they are transferred to the unloading station.

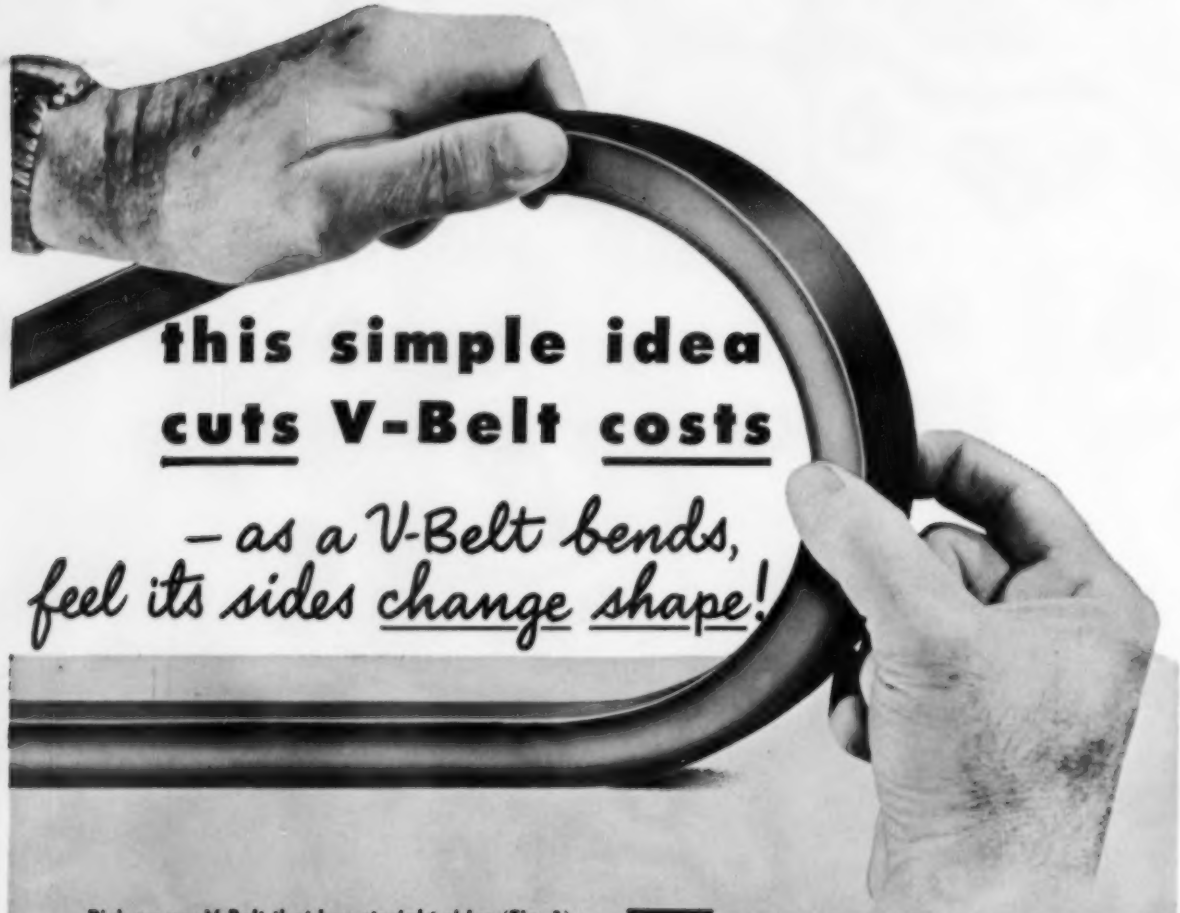
In Clearing's staff of engineers there are specialists in every field of press metal forming. They are ready to work with you to step up the pace of your production. Call or write Clearing without obligation.

CLEARING PRESSES

THE WAY TO EFFICIENT MASS PRODUCTION

CLEARING MACHINE CORPORATION *DIVISION OF U.S. INDUSTRIES, INC.*

6499 WEST 65th STREET CHICAGO 38 ILLINOIS • HAMILTON PLANT HAMILTON OHIO



this simple idea cuts V-Belt costs

— as a V-Belt bends, feel its sides change shape!

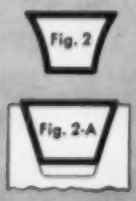
Pick up *any* V-Belt that has straight sides (Fig. 1) and bend it as if it were going around a pulley. At the same time, *grip its sides* with your fingers! You will feel the sides *bulge out* as in Fig. 1-A. Clearly, the bulging belt is forced to press *unevenly* against the V-pulley—and this concentrates wear at the points shown by arrows (Fig. 1-A).

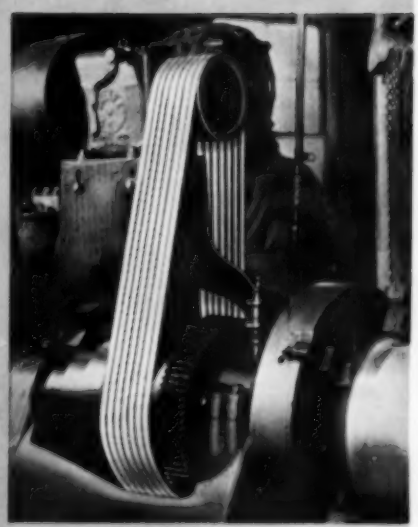
Now bend the belt with CONCAVE SIDES

(U.S. PAT. 1813698)

. . . the GATES VULCO ROPE (Fig. 2)

Instead of *bulging*, the precisely engineered CONCAVE SIDES merely *fill out* and become perfectly straight. This belt, when bent, *precisely fits* its sheave groove (Fig. 2-A). The sides press *evenly* against the V-pulley. Therefore, wear is distributed *uniformly* across the full width of the Gates Vulco Rope—and this means longer belt life and *lower belt costs* for you!





Typical Gates Vulco Rope Drive—the Gates V-belts are built with Concave Sides to insure longer belt wear.

When you buy V-belts, be sure to get the V-belt with the CONCAVE SIDES — the Gates Vulco Rope!

Gates

VULCO ROPE DRIVES

THE GATES RUBBER COMPANY
DENVER, U.S.A.
CR-5411

Gates Engineering Offices and Jobber Stocks are located in all industrial centers of the United States and Canada, and in 70 other countries throughout the world.

STEEL
January 17, 1955

Market Outlook

A STRONG first half is shaping up for 1955 in the steel market.

Some mills are booked fully for the first six months on some products, particularly the light, flat-rolled. Other mills see their first-half books filling so rapidly they are telling customers they should get orders in right away before all space is gone.

BIG PUSH—A substantial amount of this strength comes from the automobile industry which is putting on a big production push to beat a possible auto strike in May.

To meet strengthened demand, the steel industry boosted its ingot production in the week ended Jan. 16 to 82 per cent of capacity, a rise of 1.5 points over the preceding week.

TURNING POINT—By midyear, auto industry requirements may be slackening—either because of a strike or because all new-auto needs will be filled. As the auto industry is the largest user of steel, a decline in its ordering would relieve some of the pressure on the steel industry. A decline in steel production in the middle of the year would not be unexpected. At the beginning of the year some analysts said they expected the 1955 steel production trend line to look like the profile of a saucer. They thought output would dip during the summer and rise at the end of the year to the level that prevails in the early part of the year.

CUSHION—Any decline shouldn't be as deep as that of last year. Then consumers were getting some of their steel needs out of their own inventories. Now they've whittled the inventories down as far as desired, and they have to buy at least as much steel as they use. Some people think there may even be some inventory building this year. W. W. Sebald, president, Armco Steel Corp., Middletown, O., is one who thinks so.

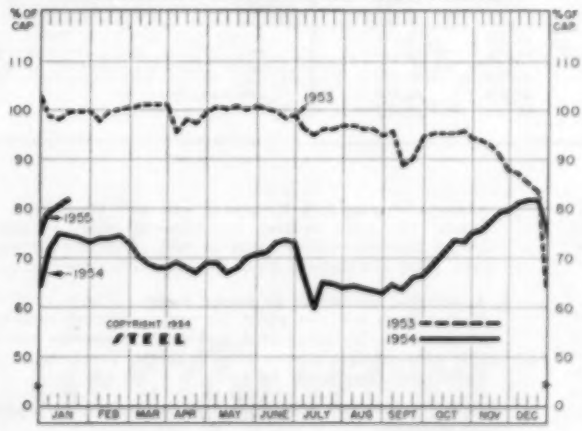
AN OFFSET—Any reduction in steel demand from the automotive industry may be offset by increases from other fields. Construction is one being counted on. By midyear it should be in full seasonal swing again. A substantial volume of bridge and school work is being figured. Foreign steel will be less of a competitor for the construction business in the United States. European countries need their steel and have raised their prices to us.

COMPETITION—That doesn't free domestic steel producers from competition. Other metals are a competition. Aluminum Co. of America has a contract to supply 200,000 feet of corrosion-resistant aluminum highway railing for Ohio turnpike bridges and overpasses. That company also is starting construction immediately at Davenport, Iowa, on a 100-in. wide cold mill for finish rolling of aluminum coiled sheet. It's to provide wide material for aluminum-clad buildings and the aircraft and other transportation buildings that Alcoa is investing $5 million in the new mill.

PRICE TRENDS—Pricewise, the trend of aluminum is up. The latest move started with a 1-cent increase in the price of aluminum pig to 21.5 cents a pound.

The price of finished steel is steady, keeping STEEL's composite at a revised figure of $117.82 a net ton.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended Jan. 16	Change	Same Week 1954	Same Week 1953
Pittsburgh	79.5	+ 1.5*	56	107
Chicago	86	+ 0.5	78.5	105.5
Mid-Atlantic	78	+ 4	83	94
Youngstown	86	0	78	106
Wheeling	94.5	0	83	101
Cleveland	93	— 1.5*	85	102
Buffalo	100	0	85	106.5
Birmingham	74	— 0.5	86	97
New England	75	+ 1	67	89
Cincinnati	83.5	+ 11	69	93
St. Louis	75	— 0.5	67	93
Detroit	88	+ 5	66.5	104.5
Western	76	+ 3	77	105.5
National Rate	82	+ 1.5	74.5	99.5

INGOT PRODUCTION‡

	Week Ended Jan. 16	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	122.9†	122.0	121.4	110.3
NET TONS (In thousands)	1,975†	1,960	1,950	1,772

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,413,278 in 1955; 2,384,549 in 1954; 2,254,459 in 1953.

Metalworking Outlook—p. 31 Technical Outlook—p. 71

Price Indexes and Composites

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Jan. 11 1955	Jan. 4 1955	Month Ago	Dec. Average
(1947-1949=100)	144.7	144.6	144.7	144.7

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Jan. 11

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	$4.535
Rails, light, 40 lb	5.917
Tie Plates	5.275
Axles, railway	7.800
Wheels, freight car, 33 in. (per wheel)	45.500
Plates, carbon	4.675
Structural Shapes	4.517
Bars, tool steel, carbon (lb)	0.480
Bars, tool steel, alloy, oil hardening die (lb)	0.525
Bars, tool steel, H.R., alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.080 (lb)	1.115
Bars, tool steel, H.R., alloy, high speed W 18, Cr 4, V 1 (lb)	1.610
Bars, H.R., alloy	8.525
Bars, H.R., stainless, 303 (lb)	0.422
Bars, H.R., carbon	5.000
Bars, reinforcing	5.012
Bars, C.F., carbon	5.160
Bars, C.F., alloy	11.275
Bars, C.F., stainless, 303 (lb)	0.438
Sheets, H.R., carbon	4.570
Sheets, C.R., carbon	5.664
Sheets, galvanized	7.220
Sheets, C.R., stainless, 302 (lb)	0.563
Sheets, electrical	$9.350
Strip, C.R., carbon	7.493
Strip, C.R., stainless, 430 (lb)	0.415
Strip, H.R., carbon	5.113
Pipe, black, buttweld (100 ft)	15.000
Pipe, galv., buttweld (100 ft)	18.605
Pipe, line (100 ft)	146.501
Casing, oil well, carbon (100 ft)	154.216
Casing, oil well, alloy (100 ft)	227.870
Tubes, boiler (100 ft)	‡
Tubing, mechanical, carbon	‡
Tubing, mechanical, stainless, 304 (100 ft)	161.193
Tin plate, hot-dipped, 1.25 lb	8.533
Tin plate, electrolytic, 0.25 lb	7.233
Black plate, can making quality	6.332
Wire, drawn, carbon	7.938
Wire, drawn, stainless, 430 (lb)	0.545
Bale ties (bundle)	5.860
Nails, wire, 8d common	7.815
Wire, barbed (80-rod spool)	7.189
Woven wire fence (20-rod roll)	16.815

‡Not available.

STEEL's FINISHED STEEL PRICE INDEX*

	Jan. 12 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	194.53	194.53	194.53	189.74	156.13
Index in cents per lb	5.270	5.270	5.270	5.140	4.230

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	$117.82	$117.82†	$117.95	$113.91	$92.50
No. 2 Fdry, Pig Iron, GT	56.54	56.54	56.54	56.54	46.22
Basic Pig Iron, GT	56.04	56.04	56.04	56.04	45.72
Malleable Pig Iron, GT	57.37	57.37	57.37	57.27	47.27
Steelmaking Scrap, GT	35.00	34.50	32.42	29.17	26.83

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130. †Revised.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Jan. 12 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.30	4.30	4.30	4.15	3.45
Bars, H.R., Chicago	4.30	4.30	4.30	4.15	3.45
Bars, H.R., deld. Philadelphia	4.55	4.55	4.55	5.302	3.93
Bars, C.F., Pittsburgh	5.40	5.40	5.40	5.20	4.10-4.15
Shapes, Std., Pittsburgh	4.25	4.25	4.25	4.10	3.40
Shapes, Std., Chicago	4.25	4.25	4.25	4.10	3.40
Shapes, deld. Philadelphia	4.53	4.53	4.53	4.38	3.42
Plates, Pittsburgh	4.225	4.225	4.225	4.10	3.50
Plates, Chicago	4.225	4.225	4.225	4.10	3.50
Plates, Coatesville, Pa.	4.225	4.225	4.225	4.35	3.60
Plates, Sparrows Point, Md.	4.225	4.225	4.225	4.10	3.50
Plates, Claymont, Del.	4.225	4.225	4.225	4.85	3.60
Sheets, H.R., Pittsburgh	4.05	4.05	4.05	3.925	3.35
Sheets, H.R., Chicago	4.05	4.05	4.05	3.925	3.35
Sheets, C.R., Pittsburgh	4.95	4.95	4.95	4.775	4.10
Sheets, C.R., Chicago	4.95	4.95	4.95	4.775	4.00
Sheets, C.R., Detroit	5.10	5.10	5.10	4.975	4.20
Sheets, Galv., Pittsburgh	5.45	5.45	5.45	5.275	4.40
Strip, H.R., Pitts.	4.05	4.05	4.05	4.425	3.25
Strip, H.R., Chicago	4.05	4.05	4.05	3.925	3.25
Strip, C.R., Pittsburgh	5.75	5.75	5.75	5.45	4.15
Strip, C.R., Chicago	5.85	5.85	5.85	5.70	4.00-4.15
Strip, C.R., Detroit	5.90	5.90	5.90	5.45-6.05	4.20-.40
Wire, Basic, Pitts.	5.75	5.75	5.75	5.525	4.50
Nails, Wire, Pittsburgh	6.85	6.85	6.85	6.55	5.30
Tin plate (1.50 lb), box, Pitts.	$9.05	$9.05	$9.05	$8.95	$7.80
SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$78.00	$78.00	$78.00	$75.50	$63.00
Wire rods, ¼-⅝" Pitts.	4.675	4.675	4.675	4.525	3.85
PIG IRON, Gross Ton					
Bessemer, Pitts.	$57.00	$57.00	$57.00	$57.00	$47.00
Basic, Valley	56.00	56.00	56.00	56.00	46.00
Basic, deld. Phila.	59.66	59.66	59.66	60.75	49.44
No. 2 Fdry, Pitts.	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Valley	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, deld. Phila	55.16	55.16	55.16	61.25	49.94
No. 2 Fdry, Birm.	52.88	52.88	52.88	52.88	39.88-42.38
No. 2 Fdry (Birm.) deld. Cin.	60.58	60.58	60.58	60.42	46.08
Malleable, Valley	56.50	56.50	56.50	56.50	46.50
Malleable, Chicago	56.50	56.50	56.50	56.50	46.50
Ferromanganese, Duquesne	190.00†	190.00†	190.00†	200.00†	175.00*

*75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts.	$36.50	$36.50	$32.50	$30.50	$30.00
No. 1 Heavy Melt, E. Pa.	32.50	32.00	31.75	28.00	23.50
No. 1 Heavy Melt, Chicago	35.00	35.00	33.00	29.50	27.00
No. 1 Heavy Melt, Valley	36.50	34.50	34.50	29.50	30.25
No. 1 Heavy Melt, Cleve.	33.50	33.00	32.50	28.50	27.25
No. 1 Heavy Melt, Buffalo	30.50	30.50	30.50	27.50	27.75
Rails, Rerolling, Chicago	53.00	53.00	53.50	38.00	29.50
No. 1 Cast, Chicago	40.00	40.00	39.50	32.50	28.50
COKE, Net Ton					
Beehive, Furn, Connlsvl.	$13.75	$13.75	$13.75	$14.75	$13.25
Beehive Fdry, Connlsvl.	16.75	16.75	16.75	16.75	15.50
Oven Fdry, Chicago	24.50	24.50	24.50	24.50	20.00

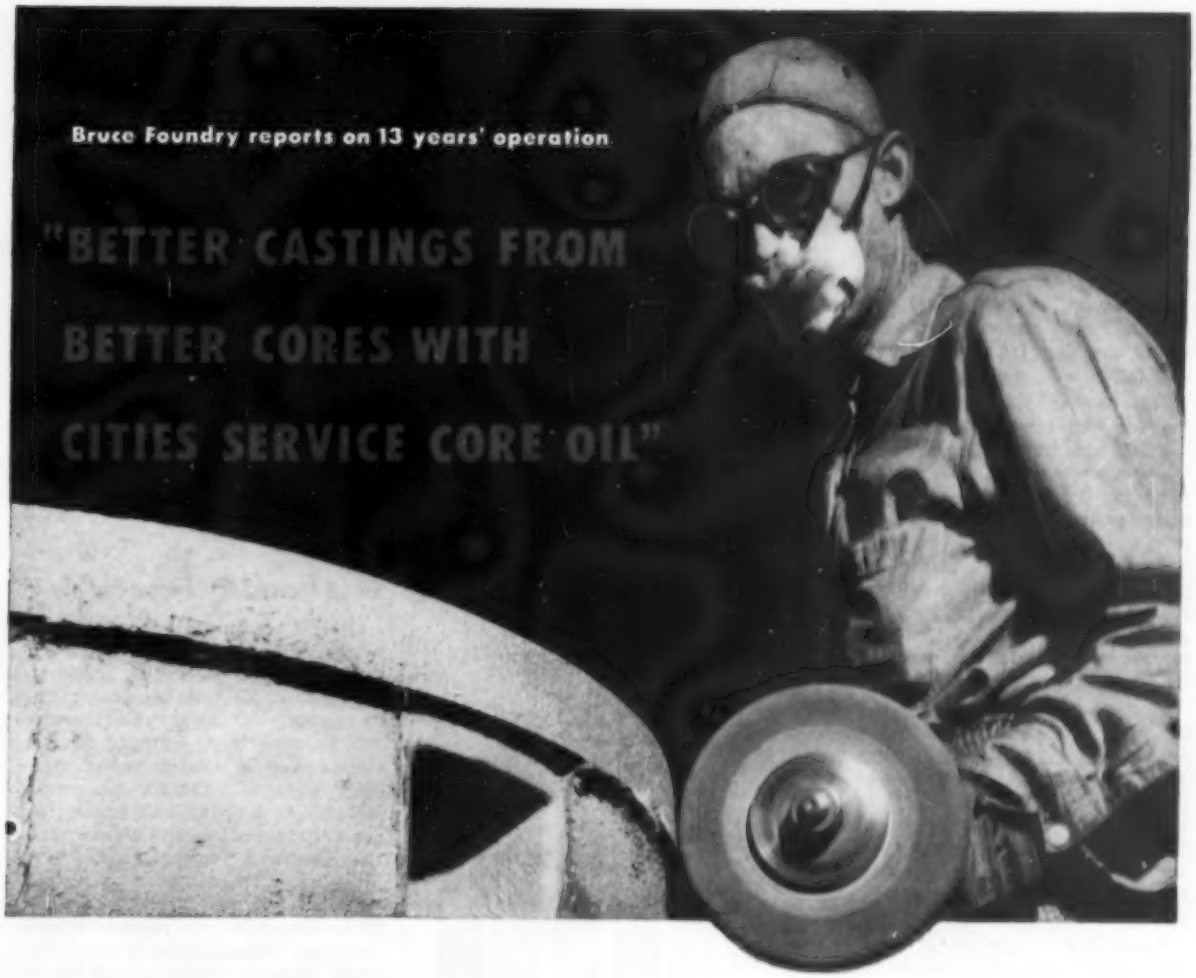
Daily Nonferrous Price Record

	Price Jan. 12	Last Change	Previous Price	Dec. Avg.	Nov. Avg.	Jan. 1954 Avg.
Copper	30.00	Apr. 12, 1954	29.75-30.00	30.000	30.000	29.750
Lead	14.80	Oct. 4, 1954	14.55	14.800	14.800	13.080
Zinc	11.50	Sept. 3, 1954	11.00	11.500	11.500	9.760
Tin	87.25	Jan. 13, 1955	86.25	88.640	91.196	85.100
Nickel	64.50	Nov. 24, 1954	60.00	64.500	60.900	60.000
Aluminum	23.20	Jan. 12, 1955	22.20	22.200	22.200	21.800
Magnesium	27.00	Mar. 9, 1953	24.50	27.000	27.000	27.000

Quotations in cents per pound based on: Copper, deld. Conn. Valley; Lead, common grade, deld. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, deld. New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 99+%, deld.; Magnesium 99.8%, Freeport, Tex.

What You Can Use the Markets Section for:

- **A source of price information.** Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.
- **A directory of producing points.** Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.
- **A source of price data for making your own comparisons.** Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- **A source of information on market trends.** Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
- **Reports on iron and steel production, and materials and product shipments.**



PRESIDENT WILLIAM J. BRUCE is high in praise for Cities Service Core Oil. Says it prevents premature collapsing, eliminates sticking, permits minimum smoke and offers absolute uniformity. Great in every respect.

Located in Tecumseh, Michigan, Bruce Foundry and Mfg. Co. has a melting capacity of 30 to 40 tons per day. For many years Bruce has turned out top-notch castings for refrigeration and automotive hydraulic equipment.

And for thirteen of those years, Cities Service Core Oil has been a major factor in the quality and rapidity of Bruce's work. Probably no one is better qualified to comment on this oil than President William J. Bruce. Here's what he says: "One of the biggest reasons I can think of for recommending Cities Service Core Oil is its absolute uniformity. This we have discovered in every single order for 13 years. As for foundry performance, I don't think there's a better oil. It has high hot strength preventing premature collapsing, yet collapses rapidly at the right time so that sand doesn't have to be dug out of castings. In addition, it eliminates sticking and permits minimum smoke."

If you'd like to learn more about the oil Mr. Bruce praises so highly, talk to a Cities Service Lubrication Engineer. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

AFTER REMOVAL FROM CORE BOX, sand core gets attention from skilled technician at Bruce Foundry. Firm makes castings for automotive and refrigeration hydraulic equipment, has used Cities Service Core Oil for 13 years.

Nonferrous Metals

Aluminum mill products will cost you more. Price boosts on them are stemming from the 1-cent-a-pound increase in pig and ingot

Nonferrous Metal Prices, Pages 116 & 117

EXPECT adjustments in the price of aluminum products to follow last week's blanket increase of 1 cent per pound, running from raw metal to mill products.

Mill product lists are figured on the basis of metal, plus labor plus market conditions. Across-the-board hikes seldom reflect market conditions for individual products. Labor costs actually figure in the new prices. In the still-soft markets of last August, aluminum men didn't set their new levels high enough to completely absorb the wage increase. Amount of raw metal needed to produce semifabricated products isn't uniform, either.

Reynolds Metals Co., first to advance its metal quotations this time (effective Jan. 10, pegging ingot at 23.2 cents, pig at 21.5 cents) was last to come out with a pricing formula for mill products. It followed Alcoa and Kaiser in extending the increase to mill products. Orders already on the books will command old prices for one month.

Sales of the light metal have increased spectacularly in the last four weeks. In a year's time they're about 25 per cent higher.

Four Factors — Fundamentals on the price increase are fourfold:

1. The outrush of scrap from the United States. Exports of aluminum scrap in 1954 were ten times the tonnage shipped in 1953, and that year was four times the 1952 level. At the same time, imports have dwindled sharply, making us a net exporter of scrap for the first time.

2. The spectacular revival of foreign markets in the last year and a half. Back firmly on its economic feet, Europe has attracted good quality scrap from the U. S., as well as primary metal that might otherwise be sold here. In Continental Europe and Asia, aluminum sells for 23 to 26.5 cents a pound. Germany, Italy, France, the United Kingdom and Japan are biggest consumers.

Imports of raw aluminum have fallen sharply. In the final four months of 1954 about 13,000 tons came in each month, compared with 18,000 tons per month in the first eight months. Canadian imports last year were off from '53's, but shipments this year are expected to be up a bit from last. An estimated quarter of a million tons of primary aluminum pig and ingot will come from Canada this year, under contract to U. S. fabricators, of which 110,000 tons is reserved for independents. These factors indicate Alcan has no intention of pulling out of U. S. markets.

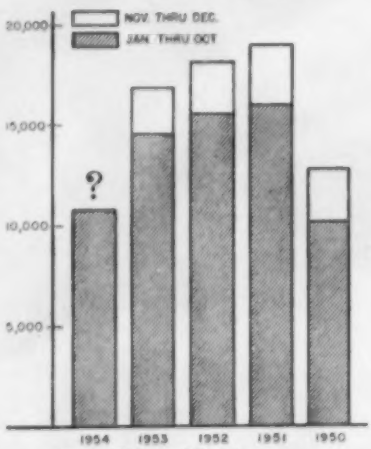
3. Higher construction costs. A long-term corrective situation is taking place, reflecting the higher-than-anticipated cost of building reduction facilities. Korean expansions cost three times as much per ton of capacity as previous facilities. The Kitimat project cost about 70 per cent more than was estimated when construction began. Aluminum companies must attract capital for further development of their industry. This pressure on price is essentially belated recognition of what should have happened several years ago.

4. An unheralded but mighty growth in fabricating capacity. The processing facilities are now at a level capable of absorbing the increased metal being produced. Alcoa has maintained a 2 to 1 ratio of production to fabricating capacity, Kaiser and Reynolds a lesser ratio. Added to that is a surge in independent fabricators, particularly in foil and extrusion fields, which has not gained the recognition it deserves. For this reason the pinch is at the pig-ingot level, not extending schedules on mill products as has usually been the case.

Winter Trends—Latest Aluminum Association statistics support the shipment boom. In one year through November, foil shipments shot from 4743 tons to 7839 tons monthly, extrusions jumped over 20 per cent. November shipments saw increases in tube, foil, rod and bar, forgings and permanent mold castings. Mild declines were registered by sheet and plate, extruded products, nonconductor wire, ACSR and bare cable and sand and die castings.

Magnesium: Back to Normal?

(shipments, thousands of lb)



Source: U.S. Bureau of the Census

Good News for Copper People

Copper consumption in 1955 will be up 15 per cent over what it was in 1954, says J. B. Cottell, president, Continental Electric Equipment Co., Cincinnati. Much of this increase will be the direct result of greater consumption of electric power. "Today," says Mr. Cottell, "American industry is doubling and tripling its consumption of electric power. Yet, the number of companies that are operating with outmoded power distribution equipment is enormous. These companies will require replacement and rehabilitation of their electrical facilities. With all this equipment in the offing, the consumption of copper along with other metals will be sharply expanded."

Market Memos

• Aluminum Co. of Canada is disposing of $24-million worth of construction and mining equipment used in carving Kitimat out of the wilderness. It is only heavy machinery, however, and does not represent a stand pat policy on expansion at the British Columbia project. Another 60,000 tons is expected to come in up there next year.

• Under new restrictions on scrap export licenses, dealers are required to submit evidence of commercial unsalability in domestic market for certain grades of nickel-bearing scrap. The move is aimed at further conserving domestic supplies.

• Financial plans for the Toquepala, Peru, copper project indicates this ownership: American Smelting & Refining Co., 57.75 per cent; Cerro De Pasco Corp., 16 per cent; Phelps Dodge Corp., 16 per cent; Newmont Mining Corp., 10.25 per cent.

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Nonferrous Metals

Cents per pound, carlots, except as otherwise noted

PRIMARY METALS AND ALLOYS

Aluminum: 99 + %, ingots 23.20, pigs 21.50 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 25.00; No. 43, 5% Si, 24.8; No. 142, 4% Cu, 26.2; No. 195, 4.5% Cu, 0.8% Si, 25.5; No. 214, 3.8% Mg, 30.2; No. 356, 7% Si, 0.3% Mg, 24.9.

Antimony: R.M.M. brand, 99.5% 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.00-28.00 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.; Elmore, O.

Beryllium Copper: 3.75-4.25% Be, $40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $2.60 per lb for 550 lb keg; $2.62 per lb for 100 lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $75.00 per lb, nom.

Copper: Electrolytic 30.00 deld. Conn. Valley, 30.00 deld. Midwest; Lake 30.00 deld; Fire refined 29.75 deld.

Germanium: 99.9%, $295 per lb, nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $110-$120 nom. per troy oz.

Lead: Common 14.80, chemical 14.90, corroding 14.90, St. Louis; N. Y. basis, add 0.20.

Lithium: 98%, $10-$14 per lb, depending on quantity.

Magnesium: 99.8%, self-palletising pig 27.00; notched ingot 27.75, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., and Madison, Ill., add 1.20 for pig and 1.25 for ingot. Sticks 1.3 in. diameter, 46.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, G and R 32.50; alloy M 34.50, 10,000 lb or more, f.o.b. Freeport, Tex., or Madison, Ill. Add 1.20 for Port Newark, N. J.

Mercury: Open market, spot, New York, $322-$325, per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3.50 per lb; pressed ingot $4.00 per lb; sintered ingot $5.55 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 66.50; 10-lb pigs, unpacked 67.65; "XX" nickel shot 69.00; "Y" nickel shot or ingots (or addition to cast iron, 64.50; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $120-$130 nom. per troy oz.

Palladium: $18-$20 per troy oz.

Platinum: $81-$84 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $120-$125 per troy oz.

Ruthenium: $50-$55 per troy oz.

Selenium: 99.5%, $6-$7.25 per lb.

Sodium: 16.50, carlots; 17.00 l.c.l.

Tantalum: Sheet, rod $39.00 per lb; powder $33.50 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot 87.25, prompt 87.25.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.2% Fe max) $4.50, grade A-2 (0.5% Fe max) $4 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000 lb lots $4.95 per lb nom., f.o.b. shipping point; less than 1000 lb $5.10 nom.; 99+% hydrogen reduced, $4.65. Treated ingots $6.70.

Zinc: Prime Western 11.50, brass special 11.75, intermediate 12.00, E. St. Louis, freight allowed over 0.50 per pound. High grade 12.85, special high grade 13.00, die casting alloy ingot 15.50, deld.

Zirconium: Sponge $10 per lb; powder electronics grade $15, flash grade $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloy 22.25-23.25; No. 12 foundry alloy (No. 2 grade) 21.75-22.25; 5% silicon alloy, 0.60 Cu max., 24.00-24.25; 13 alloy 0.60 Cu max., 24.00-24.25; 195 alloy 22.50-24.00; 108 alloy 22.25-22.50; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 22.25-23.00; grade 2, 21.25-22.25; grade 3, 20.75-21.00; grade 4, 19.75-20.25.

Brass Ingot: Red brass, No. 115, 30.00; tin bronze No. 225, 41.00; No. 245, 34.75; high-leaded tin bronze, No. 305, 34.00; No. 1 yellow, No. 405, 25.75; manganese bronze No. 421, 27.75.

Magnesium Alloy Ingot: AZ63A, 31.00; AZ91B, 34.00; AZ91C, 31.00; AZ92A, 31.00.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras 3000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, $1.68; rod, bar, wire, $1.65.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 35.36; 30,000 lb lots, 35.48; l.c.l. 35.98. Weatherproof, 100,000 lb, 36.28; 30,000 lb, 36.53; l.c.l. 37.03. Magnet wire deld., 15,000 lb or more 41.83; l.c.l. 42.58.

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq. ft. or more $20.00 per cwt; pipe, full coils $20.00 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $11; forging billets $9; hot-rolled and forged bars, $9.

ZINC

(Prices per lb c.l., f.o.b. mill) Sheets 23.00; ribbon zinc in coils, 18.50-20.50; plates 18.00-22.25.

ZIRCONIUM

Plate $27; H.R. strip $28; C.R. strip $38; forged or H.R. bars $27; wire, 0.015 in., 1 cent per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	102	78	99
Strip, C.R.	102	87	125
Plate, H.R.	97	82	95
Rod, Shapes H.R.	87	69	93
Rod, Shapes C.R.	91	75	115
Seamless Tubes	122	108	153
Shot, Blocks		65	

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	65.5	62.0	...	...
0.156-0.172	58.9	52.3	...	...
0.188	53.9	52.3	...	66.8
0.219-0.234	51.1	49.5	...	...
0.250-0.281	51.1	49.5	...	63.7
0.313	51.1	49.5	...	60.8
Cold-finished				
0.375-0.547	49.9	47.5	59.5	57.2
0.563-0.688	49.9	47.5	56.9	53.7
0.750-1.000	48.7	46.3	52.1	50.6
1.063	48.7	46.3	...	48.9
1.125-1.500	46.9	44.6	50.4	48.9
Rolled				
1.563	45.7	43.4	...	...
1.625-2.000	45.1	42.8	...	47.2
2.125-2.500	44.0	41.7	...	...
2.563-3.375	42.7	40.5	...	...

ALUMINUM

Sheets and Circles: 1100 and 3003 mill finish c.l. (30,000 lb base; freight allowed over 400 lb)

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet*	Coiled Sheet	Coiled Sheet Circles†
0.249-0.136	12-49	35.9	...	...
0.135-0.078	12-48	36.4	...	...
0.095-0.077	12-48	37.1	34.6	39.8
0.076-0.061	12-48	37.7	34.8	39.8
0.060-0.048	12-48	38.2	35.1	40.2
0.047-0.038	12-48	38.7	35.6	40.6
0.037-0.030	12-48	39.1	36.0	41.3
0.029-0.024	12-48	39.7	36.3	41.8
0.023-0.019	12-36	40.4	37.1	42.6
0.018-0.017	12-36	41.2	37.7	43.5
0.016-0.015	12-36	42.1	38.5	44.7
0.014	12-24	43.1	39.5	46.0
0.013-0.012	12-24	44.3	40.2	47.0
0.011	12-24	45.3	41.4	48.6
0.010-0.0095	12-24	46.5	42.5	50.2
0.009-0.0085	12-24	47.5	44.0	52.3
0.008-0.0075	12-24	49.4	45.2	54.1
0.007	12-15	50.9	46.7	56.4
0.006	12-15	52.5	48.1	61.4

*72-180 in. lengths. †26 in. max. dia.

ALUMINUM

Plates and Circles: Thickness 0.250-3.0 in. 24-60 in. width or dia., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	35.7	39.9
5050-F	35.7	39.9
3004-F	34.7	41.6
5052-F	37.4	43.4
6061-T6	39.6	44.0
2024-T4*	41.5	47.9
7075-T6*	49.6	56.2

*24-48 in. widths or dia., 72-180 in. lengths

ALUMINUM

Forging Stock: Round, Class 1, 47.8-37.3, in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 53.6-41 in random lengths 0.375-4.0 in. thick, widths 0.750-10 in.

Pipe: A.S.A. Schedule 40, alloy 6063-T6, 20 ft length, plain ends, 50,000 lb base, per 100 ft.

Nom. pipe size in		Nom. pipe Size, in.	
⅜	$15.70	2	$ 48.30
1	24.75	4	132.90
1¼	33.50	6	238.35
1½	40.05	8	358.60

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 94.00, 0.064-in. 73.00, 0.125-in. 60.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot rolled AZ31, 53.00, 20,000 lb or more 0.250-in. and over widths to 48 in., lengths to 144 in.; raised pattern floor plate, 50.00, 20,000 lb or more, ¼-in. thick, widths 24-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in. 69.20, 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065-in. 87.00. Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ¼-in. 67.00. Channels, 5 in. 67.80. I-Beams, 5 in. 68.20.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 1100 clippings 14.50; low copper clippings 14.50; mixed clippings 12.50; old sheet 11.00; borings and turnings 7.50; pistons and struts 8.00; crankcases 11.00; industrial castings 11.00.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.76b	48.36c	....	48.82	26.000	26.000	25.250
Yellow Brass	42.27	42.21d	42.81	45.15	19.875	19.625	18.250
Red Brass, 85%	45.89	45.83	46.43	48.70	23.000	22.750	22.250
Low Brass, 80%	44.95	44.89	45.49	47.78	22.250	22.000	21.500
Naval Brass	46.39	40.70	60.43	49.55	18.500	18.250	17.750
Commercial Bronze, 90%	47.28	47.22	47.82	49.94	23.875	23.625	23.125
Nickel Silver, 10%	56.30	60.64g	58.63	....	24.125	23.875	12.063
Phosphor Bronze, A, 5%	67.31	67.81	67.81	68.98	26.500	26.250	26.250
Silicon Bronze	53.09	53.28	53.13	70.49e	25.125	24.875	24.125
Manganese Bronze	50.09	44.25	54.70	....	18.500	18.250	17.750
Muntz Metal	44.54	40.35	....	....	18.750	18.500	18.000

a. Cents per lb f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

Copper and Brass: Heavy copper and wire No. 1 27.60-27.50; No. 2 copper 25.50-26.00; light copper 23.50-24.00; No. 1 composition red brass 21.00; No. 1 composition turnings 20.50; mixed brass turnings 14.00; new brass clippings 18.00; No. 1 brass rod turnings 15.00; light brass 12.50; heavy yellow brass 15.50; new brass rod ends 16.00; auto radiators, unsweated 17.00; cocks and faucets 17.00; brass pipe 17.50.

Lead: Heavy 11.50-11.75; battery plate 6.00-4.25; linotype and stereotype 13.50-13.75; electrotype 11.75-12.25; mixed babbitt 12.25-12.75.

Magnesium: Clippings 18.50-19.50; clean castings 17.50-18.50; iron castings, not over 10% removable Fe, 15.50-16.50.

Monel: Clippings 23.00-25.00; old sheet 21.00-23.00; turnings 16.00-18.00; rods 23.00-25.00.

Nickel: Sheets and clips 60.00-65.00; rolled anodes 60.00-65.00; turnings 40.00; rod ends 60.00-65.00.

Tin: No. 1 pewter 55.00-60.00; block tin pipe 75.00-80.00; No. 1 babbitt 50.00.

Zinc: Old zinc, 5.00-5.25; new die cast scrap, 4.75-5.00; old die cast scrap, 3.25-3.50.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings 16.50-17.50; 3003 clippings 16.50-17.25; 6151 clippings 16.50-17.25; 5052 clippings 16.50-17.50; 2014 clippings 15.50-16.25; 2017 clippings 15.50-16.25; 2024 clippings 15.50-16.25 mixed clippings 14.75-15.75; old sheet 14.50-15.25; old cast 14.25-15.75; clean old cable (free of steel) 16.25-16.75; borings and turnings 14.75-15.25.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper, Brass: No. 1 copper 29.50; No. 2 copper 28.00; light copper 26.50; refinery brass (66% copper) per dry copper content 26.00.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 29.00; No. 2 copper 27.50; light copper 26.00; No. 1 composition borings 23.25; No. 1 composition solids 23.50; heavy yellow brass solids 18.00-18.25; yellow brass turnings 17.00-17.25; radiators 19.00.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $1.70 per lb.

Copper: Flat-rolled 45.04, oval 44.54, 5000-10,000 lb; electrodeposited 39.78, cast 42.04, 2000-5000 lb lots.

Nickel: Depolarized, less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less than 200 lb $1.055; 200-499 lb $1.04; 500-999 lb $1.035; 1000 lb or more $1.03.

Zinc: Bar 20.00, bar or flat top 19.00 ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100 lb drums.

Chromic Acid: Less than 10,000 lb 28.50; over 10,000 lb 27.50.

Copper Cyanide: Under 1000 lb 63.90; 1000 lb and over 61.90.

Copper Sulphate: 100-6000 lb 11.35; 6000-12,000 lb 11.1:; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.

Nickel Chloride: 100 lb 45.00; 200 lb 43.00; 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.

Nickel Sulphate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-35,000 lb 30.00; 36,000 lb and over 29.00.

Silver Cyanide: Cents per ounce, 16 oz 80.625; 100 oz 78.50; 25,000 oz and over 77.325.

Sodium Cyanide: Egg, under 1000 lb 19.50; 1000-19,900 lb 18.80; 20,000 lb and over 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb 68.2; 100-500 lb 64.1; 700-1900 lb 51.6; 2000-9900 lb 49.8; 10,000 lb or more 48.7.

Stannous Chloride (Anhydrous): Less than 50 lb $1.533; 50 lb $1.193; 100-300 lb $1.043; 400-900 lb $1.019; 1000-1900 lb 99.4; 2000-4900 lb 96.8; 5000-19,000 lb 89.7; 20,000 lb and over 83.6

Stannous Sulphate: Less than 5 lb $1.235; 50 lb 93.5; 100-1900 lb 91.5; 2000 lb and over 89.5.

Zinc Cyanide: Under 1000 lb 54.30; 1000 lb and over 52.30.

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UNITED STATES STEEL

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; Key on page 119. Key to footnotes, page 121.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5 ..... $61.50

INGOTS, Alloy (NT)

Detroit R7 ..... $65.00
Houston S5 ..... 70.00
Midland,Pa. C18 ..... 65.00
Munhall,Pa. U5 ..... 65.00

BILLETS, BLOOMS & SLABS

Carbon, Rerolling (NT)

Aliquippa,Pa. J5 ..... $54.00
Bessemer,Pa. U5 ..... 54.00
Buffalo R2 ..... 54.00
Clairton,Pa. U5 ..... 54.00
Ensley,Ala. T2 ..... 54.00
Fairfield,Ala. T2 ..... 54.00
Fontana,Calif. K1 ..... 72.00
Gary,Ind. U5 ..... 54.00
Johnstown,Pa. B2 ..... 54.00
Lackawanna,N.Y. B2 .. 54.00
Munhall,Pa. U5 ..... 54.00
Pittsburgh J5 ..... 54.00
So.Chicago,Ill. R2, U5.. 54.00
So.Duquesne,Pa. U5 ... 54.00
Youngstown R2 ..... 54.00

Carbon, Forging (NT)

Aliquippa,Pa. J5 ..... $78.00
Bessemer,Pa. U5 ..... 78.00
Buffalo R2 ..... 78.00
Canton,O. R2 ..... 80.00
Clairton,Pa. U5 ..... 78.00
Conshohocken,Pa. A3 .. 83.00
Ensley,Ala. T2 ..... 78.00
Fairfield,Ala. T2 ..... 78.00
Fontana,Calif. K1 ..... 86.00
Gary,Ind. U5 ..... 78.00
Geneva,Utah C11 ..... 78.00
Houston S5 ..... 83.00
Johnstown,Pa. B2 ..... 78.00
Lackawanna,N.Y. B2 .. 78.00
LosAngeles B3 ..... 87.50
Midland,Pa. C18 ..... 78.00
Munhall,Pa. U5 ..... 78.00
Pittsburgh J5 ..... 78.00
seattle B3 ..... 91.50
So.Chicago R2,U5,W14.. 78.00
So.Duquesne,Pa. U5 ... 78.00
So.SanFrancisco B3 ... 87.50

Alloy, Forging (NT)

Bethlehem,Pa. B2 .... $86.00
Buffalo R2 ..... 86.00
Canton,O. R2, T7 ..... 86.00
Conshohocken,Pa. A3 .. 93.00
Detroit R7 ..... 86.00
Fontana,Calif. K1 .... 105.00
Gary,Ind. U5 ..... 86.00
Houston S5 ..... 91.00
Ind.Harbor,Ind. Y1 ... 86.00
Johnstown,Pa. B2 ..... 86.00
Lackawanna,N.Y. B2 .. 86.00
LosAngeles B3 ..... 106.00
Massillon,O. R2 ..... 86.00
Midland,Pa. C18 ..... 86.00
Munhall,Pa. U5 ..... 86.00
So.Chicago, R2,U5,W14.. 86.00
So.Duquesne,Pa. U5 ... 86.00
Struthers,O. Y1 ..... 86.00
Warren,O. C17 ..... 86.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2 ..... $96.50
Canton,O. R2 ..... 96.50
Cleveland R2 ..... 96.50
Gary,Ind. U5 ..... 96.50
So.Chicago R2, W14 .. 96.50
So.Duquesne,Pa. U5 ... 96.50

SKELP

Aliquippa,Pa. J5 ..... 4.00
Fontana,Calif. K1 ..... 4.775
Munhall,Pa. U5 ..... 3.90
SparrowsPoint,Md. B2 .. 3.90
Warren,O. R2 ..... 3.90
Youngstown R2, U5 .... 3.90

WIRE RODS

AlabamaCity,Ala. R2 .. 4.675
Aliquippa,Pa. J5 ..... 4.675
Alton,Ill. L1 ..... 4.85
Buffalo B11, W12 ..... 4.675
Cleveland A7 ..... 4.675
Donora,Pa. A7 ..... 4.675
Fairfield,Ala. T2 ..... 4.675
Fontana,Calif. K1 ..... 5.475
Houston S5 ..... 4.925
IndianaHarbor,Ind. Y1 . 4.675
Johnstown,Pa. B2 ..... 4.675
Joliet,Ill. A7 ..... 4.675
KansasCity,Mo. S5 .... 4.925
Kokomo,Ind. C16 ..... 4.775
LosAngeles B3 ..... 5.475
Minnequa,Colo. C10 ... 4.925
Monessen,Pa. P7 ..... 4.675
No.Tonawanda,N.Y. B11 4.675
Pittsburg,Calif. C11 ... 5.325
Portsmouth P12 ..... 4.675
Roebling,N.J. R5 ..... 4.775
So.Chicago,Ill. R2 ..... 4.675
SparrowsPoint,Md. B2.. 4.775
Sterling,Ill.(1) N15 .... 4.675
Sterling,Ill. N15 ..... 4.775
Struthers,O. Y1 ..... 4.675
Torrance,Calif. C11 ... 5.475
Worcester,Mass. A7 .... 4.975

STRUCTURALS

Carbon Steel Stand. Shapes

Ala.City,Ala. R2 ..... 4.25
Aliquippa,Pa. J5 ..... 4.25
Bessemer,Ala. T2 ..... 4.25
Bethlehem,Pa. B2 ..... 4.30
Birmingham C15 ..... 4.25
Clairton,Pa. U5 ..... 4.25
Fairfield,Ala. T2 ..... 4.25
Fontana,Calif. K1 ..... 4.90
Gary,Ind. U5 ..... 4.25
Geneva,Utah C11 ..... 4.25
Houston S5 ..... 4.30
Ind.Harbor,Ind. I-2 .... 4.25
Johnstown,Pa. B2 ..... 4.30
KansasCity,Mo. S5 .... 4.30
Lackawanna,N.Y. B2 .. 4.30
LosAngeles B3 ..... 4.95
Minnequa,Colo. C10 .... 4.70
Munhall,Pa. U5 ..... 4.25
Niles,Calif. P1 ..... 4.90
Phoenixville,Pa. P4 .... 3.95
So.Chicago,Ill. U5 ..... 4.25

Alloy Stand. Shapes

Clairton,Pa. U5 ..... 5.20
Fontana,Calif. K1 ..... 6.60
Gary,Ind. U5 ..... 5.20
Houston S5 ..... 5.45
Munhall,Pa. U5 ..... 5.20
So.Chicago,Ill. U5 ..... 5.20

H.S., L.A. Stand. Shapes

Aliquippa,Pa. J5 ..... 6.40
Bessemer,Ala. T2 ..... 6.40
Bethlehem,Pa. B2 ..... 6.45
Clairton,Pa. U5 ..... 6.40
Fairfield,Ala. T2 ..... 6.40
Fontana,Calif. K1 ..... 7.05
Gary,Ind. U5 ..... 6.40
Geneva,Utah C11 ..... 6.40
Houston S5 ..... 6.45
Ind.Harbor,Ind. I-2, Y1 6.40
Johnstown,Pa. B2 ..... 6.45
KansasCity,Mo. S5 .... 6.45
Lackawanna,N.Y. B2 .. 6.45
LosAngeles B3 ..... 7.10
Munhall,Pa. U5 ..... 6.40
Seattle B3 ..... 7.15
So.Chicago,Ill. U5, W14 6.40
So.SanFrancisco B3 .... 7.05
Struthers,O. Y1 ..... 6.40

H.S., L.A. Wide Flange

Bethlehem,Pa. B2 ..... 6.45
Lackawanna,N.Y. B2 .. 6.45
Munhall,Pa. U5 ..... 6.40
So.Chicago,Ill. U5 ..... 6.40

Wide Flange

Bethlehem,Pa. B2 ..... 6.30
Clairton,Pa. U5 ..... 6.20
Fontana,Calif. K1 ..... 6.25
Lackawanna,N.Y. B2 .. 6.30
Munhall,Pa. U5 ..... 6.25
Phoenixville,Pa. P4 .... 3.95
So.Chicago,Ill. U5 ..... 6.25

PILING

BEARING PILES

Munhall,Pa. U5 ..... 4.35
So.Chicago,Ill. U5 ..... 4.35

STEEL SHEET PILING

Ind.Harbor,Ind. I-2 ... 5.075
Lackawanna,N.Y. B2 .. 5.075
Munhall,Pa. U5 ..... 5.075
So.Chicago,Ill. U5 .... 5.075

PLATES

PLATES, Carbon Steel

Ala.City,Ala. R2 ..... 4.225
Aliquippa,Pa. J5 ..... 4.225
Ashland,Ky.(15) A10 .. 4.225
Bessemer,Ala. T2 ..... 4.225
Buffalo R2 ..... 4.225
Clairton,Pa. U5 ..... 4.225
Claymont,Del. C22 .... 4.225
Cleveland J5, R2 ..... 4.225
Coatesville,Pa. L7 .... 4.225
Conshohocken,Pa. A3 .. 4.225
Ecorse,Mich. G5 ..... 4.325
Fairfield,Ala. T2 ..... 4.225
Fontana,Calif.(30) K1.. 4.875
Gary,Ind. U5 ..... 4.225
Geneva,Utah C11 ..... 4.225
GraniteCity,Ill. G4 .... 4.425
Harrisburg,Pa. C5 ..... 3.975
Houston S5 ..... 4.275
Ind.Harbor,Ind. I-2, Y1 4.225
Johnstown,Pa. B2 ..... 4.225
Lackawanna,N.Y. B2 .. 4.225
LoneStar, Tex. L6 ..... 4.55
Mansfield,O. B6 ..... 4.225
Minnequa,Colo. C10 .... 5.075
Munhall,Pa. U5 ..... 4.225
Newport,Ky. N9 ..... 4.225
Pittsburgh J5 ..... 4.225
Riverdale,Ill. A1 ..... 4.225
Seattle B3 ..... 5.125
Sharon,Pa. S3 ..... 4.225
So.Chicago,Ill. R2 ..... 4.225
So.Chicago,Ill. U5,W14 4.225
SparrowsPoint,Md. B2.. 4.225
Steubenville,O. W10 .... 4.225
Warren,O. R2 ..... 4.225
Weirton,W.Va. W6 .... 4.225
Youngstown R2,U5,Y1.. 4.225

PLATES, Carbon Abras. Resist.

Fontana,Calif. K1 .... 6.025
Geneva,Utah C11 ..... 5.375

PLATES, Wrought Iron

Economy,Pa. B14 ..... 9.50

PLATES, High-Strength Low-Alloy

Aliquippa,Pa. J5 ..... 6.45
Bessemer,Ala. T2 ..... 6.45
Clairton,Pa. U5 ..... 6.45
Cleveland J5, R2 ..... 6.45
Conshohocken,Pa. A3 .. 6.45
Ecorse,Mich. G5 ..... 6.55
Fairfield,Ala. T2 ..... 6.45
Fontana,Calif.(30) K1 .. 7.15
Gary,Ind. U5 ..... 6.45
Geneva,Utah C11 ..... 6.45
Houston S5 ..... 6.50
Ind.Harbor,Ind. I-2, Y1 6.45
Johnstown,Pa. B2 ..... 6.45
Lackawanna,N.Y. B2 .. 6.45
LosAngeles B3 ..... 7.35
Munhall,Pa. U5 ..... 6.45
Pittsburgh J5 ..... 6.45
Seattle B3 ..... 7.35
Sharon,Pa. S3 ..... 6.45
So.Chicago,Ill. U5, W14 6.45
SparrowsPoint,Md. B2 .. 6.45
Youngstown U5, Y1 .... 6.45

PLATES, Alloy

Claymont,Del. C22 ..... 5.80
Coatesville,Pa. L7 ..... 5.80
Fontana,Calif. K1 ..... 6.45
Gary Ind. U5 ..... 5.80
Houston S5 ..... 5.85
Ind.Harbor,Ind. Y1 .... 5.80
Johnstown,Pa. B2 ..... 5.80
Munhall,Pa. U5 ..... 5.80
Newport,Ky. N9 ..... 5.80
Seattle B3 ..... 6.70
Sharon,Pa. S3 ..... 5.80
So.Chicago,Ill. U5, W14 5.80
SparrowsPoint,Md. B2 .. 5.80
Youngstown Y1 ..... 5.80

FLOOR PLATES

Cleveland J5 ..... 5.275
Conshohocken,Pa. A3 .. 5.275
Harrisburg,Pa. C5 ..... 5.15
Ind.Harbor,Ind. I-2 .... 5.275
Munhall,Pa. U5 ..... 5.275
So.Chicago,Ill. U5 ..... 5.275

PLATES, Ingot Iron

Ashland c.l. (15) A10.. 4.475
Ashland l.c.l. (15) A10. 4.975
Cleveland c.l. R2 ..... 4.325
Warren,O. c.l. R2 ..... 4.325

BARS

BARS, Hot-Rolled Carbon

Ala.City,Ala. R2 ..... 4.30
Aliquippa,Pa. J5 ..... 4.30
Alton,Ill. L1 ..... 4.50
Atlanta,Ga. A11 ..... 4.50
Bessemer,Ala. T2 ..... 4.30
Birmingham C15 ..... 4.30
Buffalo R2 ..... 4.30
Canton,O. R2 ..... 4.40
Clairton,Pa. U5 ..... 4.30
Cleveland R2 ..... 4.30
Ecorse,Mich. G5 ..... 4.40
Emeryville,Calif. J7 .... 5.05
Fairfield,Ala. T2 ..... 4.30
Fairless,Pa. U5 ..... 4.45
Fontana,Calif. K1 ..... 5.00
Gary,Ind. U5 ..... 4.30
Houston S5 ..... 4.55
Ind.Harbor,Ind. I-2, Y1. 4.30
Johnstown,Pa. B2 ..... 4.30
KansasCity,Mo. S5 .... 4.55
Lackawanna,N.Y. B2 .. 4.30
LosAngeles B3 ..... 5.00
Massillon,O. R2 ..... 4.40
Midland,Pa. C18 ..... 4.30
Milton,Pa. M18 ..... 4.30
Minnequa,Colo. C10 .... 4.75
Niles,Calif. P1 ..... 5.00
N.Tonawanda,N.Y. B11.. 4.30
Pittsburg,Calif. C11 .... 5.00
Pittsburgh J5 ..... 4.30
Portland,Oreg. O4 ..... 5.05
Seattle B3, N14, P23.... 5.05
So.Chicago, R2,U5,W14.. 4.30
So.Duquesne,Pa. U5 .... 4.30
So.SanFran.,Calif. B3 .. 5.05
Sterling,Ill.(1) N15 .... 4.30
Sterling,Ill. N15 ..... 4.40
Struthers,O. Y1 ..... 4.30
Torrance,Calif. C11 .... 5.00
Warren,O. R2 ..... 4.30
Weirton,W.Va. W6 ..... 4.30
Youngstown R2, U5 .... 4.30

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2 ..... 5.075
Buffalo R2 ..... 5.075
Canton,O. R2, T7 ..... 5.075
Clairton,Pa. U5 ..... 5.075
Detroit R7 ..... 5.075
Ecorse,Mich. G5 ..... 5.175
Fontana,Calif. K1 ..... 6.125
Fairless,Pa. U5 ..... 5.225
Gary,Ind. U5 ..... 5.075
Houston S5 ..... 5.325
Ind.Harbor,Ind. I-2, Y1. 5.075
Johnstown,Pa. B2 ..... 5.075
KansasCity,Mo. S5 .... 5.325
Lackawanna,N.Y. B2 .. 5.075
LosAngeles B3 ..... 6.125
Massillon,O. R2 ..... 5.075
Midland,Pa. C18 ..... 5.075
So.Chicago R2, U5, W14 5.075
So.Duquesne,Pa. U5 .... 5.075
Struthers,O. Y1 ..... 5.075
Warren,O. C17 ..... 5.075
Youngstown U5 ..... 5.075

BARS, H.R. Leaded Alloy

Warren,O. C17 ..... 5.825

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5 ..... 6.45
Bessemer,Ala. T2 ..... 6.45
Bethlehem,Pa. B2 ..... 6.45
Clairton,Pa. U5 ..... 6.45
Cleveland R2 ..... 6.45
Ecorse,Mich. G5 ..... 6.55
Fairfield,Ala. T2 ..... 6.45
Fontana,Calif. K1 ..... 7.70
Gary,Ind. U5 ..... 6.45
Houston S5 ..... 6.70
Ind.Harb.,Ind. I-2, Y1.. 6.45
Johnstown,Pa. B2 ..... 6.45
KansasCity,Mo. S5 .... 6.70
Lackawanna,N.Y. B2 .. 6.45
LosAngeles B3 ..... 7.15
Pittsburgh J5 ..... 6.45
Seattle B3 ..... 7.20
So.Chicago W14 ..... 6.45
So.Duquesne,Pa. U5 .... 6.45
So.SanFrancisco B3 .... 7.20
Struthers,O. Y1 ..... 6.45
Warren,O. R2 ..... 6.45
Youngstown U5 ..... 6.45

BAR SIZE ANGLES; H.R. Carbon

Bethlehem,Pa. B2 ..... 4.45

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5 ..... 4.30
Atlanta A11 ..... 4.50
Fontana,Calif. K1 ..... 5.00
Niles,Calif. P1 ..... 5.00
Pittsburgh J5 ..... 4.30
Portland,Oreg. O4 ..... 5.05
SanFrancisco S7 ..... 4.70

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5 ..... 5.20
Gary,Ind. U5 ..... 5.20
Houston S5 ..... 5.45
KansasCity S5 ..... 5.45
Youngstown U5 ..... 5.20

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 .... 5.40
BeaverFalls,Pa. M12, R2 5.40
Buffalo B5 ..... 5.45
Camden,N.J. P13 ..... 5.85
Carnegie,Pa. C12 ..... 5.40
Chicago W18 ..... 5.40
Cleveland A7, C20 .... 5.40
Detroit R7 ..... 5.40
Detroit B5, P17 ..... 5.60
Donora,Pa. A7 ..... 5.40
Elyria,O. W8 ..... 5.40
FranklinPark,Ill. N5 ... 5.40
Gary,Ind. R2 ..... 5.40
GreenBay,Wis. F7 ..... 5.40
Hammond,Ind. L2, M13 5.40
Hartford,Conn. R2 .... 5.90
Harvey,Ill. B5 ..... 5.40
LosAngeles R2, S30 .... 6.85
Mansfield,Mass. B5 .... 5.95
Massillon,O. R2, R8 .... 5.40
Midland,Pa. C18 ..... 5.40
Monaca,Pa. S17 ..... 5.40
Newark,N.J. W18 ..... 5.85
NewCastle,Pa.(17) B4 .. 5.40
Pittsburgh J5 ..... 5.40
Plymouth,Mich. P5 .... 5.45
Putnam,Conn. W18 .... 5.95
Readville,Mass. C14 .... 5.90
So.Chicago,Ill. W14 .... 5.40
SpringCity,Pa. K3 ..... 5.85
Struthers,O. Y1 ..... 5.40
Waukegan,Ill. A7 ..... 5.40
Worcester,Mass. W19 ... 5.85
Youngstown F3, Y1 .... 5.40

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md.(5) C19. 4.65

BARS, Cold-Finished Alloy

Ambridge,Pa. W18 .... 6.625
BeaverFalls,Pa. M12,R2 6.625
Bethlehem,Pa. B2 ..... 6.625
Buffalo B5 ..... 6.625
Camden,N.J. P13 ..... 6.80
Canton,O. T7 ..... 6.625
Carnegie,Pa. C12 ..... 6.625
Chicago W18 ..... 6.625
Cleveland A7, C20 .... 6.625
Detroit R7 ..... 6.625
Detroit B5, P17 ..... 6.825
Donora,Pa. A7 ..... 6.625
Elyria,O. W8 ..... 6.625
Gary,Ind. R2 ..... 6.625
GreenBay,Wis. F7 ..... 6.625
Hammond,Ind. L2, M13 6.625
Hartford,Conn. R2 .... 6.925
Harvey,Ill. B5 ..... 6.625
Lackawanna,N.Y. B2 .. 6.625
LosAngeles S30 ..... 8.30
Mansfield,Mass. B5 .... 6.925
Massillon,O. R2, R8 .... 6.625
Midland,Pa. C18 ..... 6.625
Monaca,Pa. S17 ..... 6.625
Newark,N.J. W18 ..... 6.80
Plymouth,Mich. P5 .... 6.825
So.Chicago W14 ..... 6.625
SpringCity,Pa. K3 ..... 6.80
Struthers,O. Y1 ..... 6.625
Warren,O. C17 ..... 6.625
Waukegan,Ill. A7 ..... 6.625
Worcester,Mass. A7 .... 6.925
Youngstown F3, Y1 .... 6.625

BARS, C.F. Leaded Alloy

Ambridge,Pa. W18 .... 7.625
Camden,N.J. P13 ..... 7.70
Carnegie,Pa. C12 ..... 7.525
Chicago W18 ..... 7.525
Cleveland C30 ..... 7.40
Monaca,Pa. S17 ..... 7.525
Newark,N.J. W18 ..... 7.70
SpringCity,Pa. K3 ..... 7.70
Warren,O. C17 ..... 7.525

BARS, Reinforcing (To fabricators)

Ala.City,Ala. R2 ..... 4.30
Atlanta A11 ..... 4.50
Birmingham C15 ..... 4.30
Buffalo R2 ..... 4.30
Cleveland R2 ..... 4.30
Emeryville,Calif. J7 .... 5.05
Fairfield,Ala. T2 ..... 4.30
Fairless,Pa. U5 ..... 4.45
Fontana,Calif. K1 ..... 5.00
Ft.Worth,Tex.(42) T4 .. 4.90
Gary,Ind. U5 ..... 4.30
Houston S5 ..... 4.55

Ind.Harbor, Ind. I-2, Y1..4.30
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 ....4.55
Lackawanna,N.Y. B2 ...4.30
LosAngeles B3 .....5.00
Milton,Pa. M18 .....4.30
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 .....5.00
Pittsburg,Calif. C11 ...5.00
Pittsburgh J5 .....4.30
Portland,Oreg. O4 .....5.05
SandSprings,Okla. S5 ..4.80
Seattle B3, N14, P23 ..5.05
So.Chicago B2 .....4.30
So.Duquesne,Pa. U5 ....4.30
So.SanFrancisco B3 ....5.05
SparrowsPoint,Md. B2 ..4.30
Sterling,Ill.(1) N15 ....4.30
Sterling,Ill. N15 .....4.40
Struthers,O. Y1 .....4.30
Torrance,Calif. C11 ....5.00
Youngstown R2, U5 ....4.30

BARS, Reinforcing
(Fabricated; to Consumers)

Johnstown,Pa., ¼-1" B2..5.70
KansasCity S5 .....6.50
LosAngeles B3 .....5.95
Marion,O. P11 .....5.55
Pittsburgh J5, U8 ....5.72
Seattle B3, N14, P23 ..6.15
So.SanFrancisco B3 ...6.00
SparrowsPt. ¼-1" B2...5.70
Williamsport,Pa. S19 ..5.60

RAIL STEEL BARS

Avis,Pa.(3) J8 .....4.25
ChicagoHts.(3) C2, I-2..4.20
ChicagoHts.(4) C2, I-2..4.30
Ft.Worth,Tex.(26) T4 ..4.75
Franklin,Pa. (3) F5 ..4.20
Franklin,Pa. (4) F5 ..4.30
Marion,O.(3) P11 .....4.15
Moline,Ill.(3) R2 .....4.30
Tonawanda(3) B12 ....4.15
Tonawanda(4) B12 ....4.30
Williamsport,Pa.(3) S19.4.30

BARS, Wrought Iron

Economy,Pa.(S.R.) B14 10.85
Economy,Pa.(D.R.) B14 13.80
Economy(Staybolt) B14 13.80
McK.Rks(S.R.) L5 ...10.85
McK.Rks.(D.R.) L5 ..14.75
McK.Rks.(Staybolt) L5 16.25

SHEETS

SHEETS, Hot-Rolled Steel
(18 Gage and Heavier)

Ala.City,Ala. R2 .....4.05
Allenport,Pa. P7 .....4.05
Ashland,Ky.(8) A10 ...4.05
Cleveland J5, R2 .....4.05
Conshohocken,Pa. A3 ...4.10
Detroit(8) M1 .....4.15
Ecorse,Mich. G5 .....4.15
Fairfield,Ala. T2 .....4.05
Fairless,Pa. U5 .....4.10
Fontana,Calif. K1 ....4.825
Gary,Ind. U5 .....4.05
Geneva,Utah C11 .....4.15
GraniteCity,Ill. G4 ....4.25
Houston S5 .....4.30
Ind.Harbor,Ind. I-2, Y1.4.05
Irvin,Pa. U5 .....4.05
Kokomo,Ind. C16 .....4.15
Lackawanna,N.Y. B2 ..4.05
Mansfield,O. E6 (37) ...4.05
Mansfield,O. E6(38) ...4.80
Munhall,Pa. U5 .....4.05
Newport,Ky. N9 .....4.05
Niles,O. N12 .....4.05
Pittsburg,Calif. C11 ....4.75
Pittsburgh J5 .....4.05
Portsmouth,O. P12 .....4.05
Riverdale,Ill. A1 .....4.05
Sharon,Pa. S3 .....4.05
So.Chicago,Ill. W14 .....4.05
SparrowsPoint,Md. B2 ..4.05
Steubenville,O. W10 ....4.05
Warren,O. R2 .....4.05
Weirton,W.Va. W6 ....4.05
Youngstown U5, Y1 ....4.05

SHEETS, H.R. (19 ga. lighter)

Ala.City,Ala. R2 .....5.25
Kokomo,Ind. C16 .....5.20
Niles,O. N12 .....4.95

SHEETS, H.R. Alloy

Ind.Harbor,Ind. Y1 ....5.80
Youngstown Y1 .....5.80

SHEETS, H.R. (14 ga. heavier)
High-Strength Low-Alloy

Cleveland J5, R2 .....6.10
Conshohocken,Pa. A3 ..6.15
Ecorse,Mich. G5 .....6.20
Fairfield,Ala. T2 .....6.10
Fairless,Pa. U5 .....6.15
Fontana,Calif. K1 ....6.875
Gary,Ind. U5 .....6.10
Ind.Harbor,Ind. I-2, Y1..6.10
Irvin,Pa. U5 .....6.10
Lackawanna(36) B2 ....6.10
Munhall,Pa. U5 .....6.10
Pittsburgh J5 .....6.10
Sharon,Pa. S3 .....6.10
So.Chicago,Ill. U5 .....6.10
SparrowsPoint(36) B2 ..6.10
Warren,O. R2 .....6.10
Weirton,W.Va. W6 ....6.10
Youngstown U5, Y1 ....6.10

SHEETS, Hot-Rolled Ingot Iron
(18 Gage and Heavier)

Ashland,Ky.(8) A10 ....4.30
Cleveland R2 .....4.65
Ind.Harbor,Ind. I-2 ....4.30
Warren,O. R2 .....4.65

SHEETS, Cold-Rolled Steel
(Commercial Quality)

Allenport,Pa. P7 .....4.95
Cleveland J5, R2 .....4.95
Conshohocken,Pa. A3....5.00
Ecorse,Mich. G5 .....5.05
Fairfield,Ala. T2 .....4.95
Fairless,Pa. U5 .....5.00
Follansbee,W.Va. F4 ...4.95
Fontana,Calif. K1 .....6.05
Gary,Ind. U5 .....4.95
GraniteCity,Ill. G4 ....5.15
Ind.Harbor,Ind. I-2, Y1..4.95
Irvin,Pa. U5 .....4.95
Lackawanna,N.Y. B2 ...4.95
Middletown,O. A10 .....4.95
Pittsburg,Calif. C11 ....5.90
Pittsburgh J5 .....4.95
Portsmouth,O. P12 .....4.95
SparrowsPoint,Md. B2..4.95
Warren,O. R2 .....4.95
Weirton,W.Va. W6 ....4.95
Youngstown Y1 .....4.95

SHEETS, Cold-Rolled
High-Strength Low-Alloy

Cleveland J5, R2 .....7.50
Ecorse,Mich. G5 .....7.60
Fairless,Pa. U5 .....7.55
Fontana,Calif. K1 .....8.55
Gary,Ind. U5 .....7.50
Indiana Harbor,Ind. Y1 ..7.50
Irvin,Pa. U5 .....7.50
Lackawanna(37) B2 ...7.50
Pittsburgh J5 .....7.50
SparrowsPoint(38) B2 ..7.50
Warren,O. R2 .....7.50
Weirton,W.Va. W6 ....7.50
Youngstown Y1 .....7.50

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....5.55
Middletown,O. A10 ....5.45
Warren,O. R2 .....5.55

SHEETS, Culvert

	Cu	Cu
(16 Ga.)	Alloy	Fe
Ashland,Ky. A10	6.50	....
Canton,O. R2	6.30	7.10
Fairfield T2	5.70	....
Gary,Ind. U5	5.70	5.95
Ind.Harbor I-2	5.70	5.95
Irvin,Pa. U5	5.70	....
Kokomo,Ind. C16	5.80	....
MartinsFry.,O. W10	5.70	....
Newport,Ky. N9	5.70	5.95
Pitts.,Calif. C11	6.45	....
SparrowsPt. B2	5.70	....

SHEETS, Culvert—Pure Iron

Ashland,Ky. A10 .....6.75
Gary,Ind. U5 .....5.95
MartinsFerry,O. W10 ..5.95

SHEETS, Galvanized Steel
Hot-Dipped

Ala.City,Ala. R2 .....5.45‡
Ashland,Ky. A10 .....5.45*
Butler,Pa. A10 .....5.45†
Canton,O. R3 .....5.45‡
Delphos,O. N16 .....6.10‡
Dover,O. R1 .....5.45‡
Fairfield,Ala. T2 .....5.45†
Gary,Ind. U5 .....5.45*
GraniteCity,Ill. G4 ....5.65‡
Ind.Harbor,Ind. I-2 ....5.45†
Irvin,Pa. U5 .....5.45†
Kokomo,Ind. C16 .....5.55‡
MartinsFerry,O. W10 ..5.45*
Middletown,O. A10 .....5.45†
Newport,Ky. N9 .....5.45†
Niles,O. N12 .....5.45‡
Pittsburg,Calif. C11 ..6.20*
SparrowsPt., Md. B2 ..5.45‡
Weirton,W.Va. W6 ....5.45*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....6.225

SHEETS, Galvanized
High-Strength Low-Alloy

Irvin,Pa. U5 .....8.20
SparrowsPoint(39) B2 ..8.20

SHEETS, Galvannealed Steel

Canton,O. R2 .....5.85
Irvin,Pa. U5 .....5.85
Kokomo,Ind. C16 ....5.90†
Newport,Ky. N9 .....5.85
Niles,O. N12 .....5.85

SHEETS, Galvanized Ingot Iron

Ashland,Ky.(8) A10 ....5.70
Canton,O. R2 .....6.20

SHEETS, Galvanized
Ingot Iron
(Hot-dipped Continuous)

Ashland,Ky. A10 .....5.70
Butler,Pa. A10 .....5.70
Middletown,O. A10 ....5.70

SHEETS, Electrogalvanized

Cleveland(28) R2 .....6.20
Niles,O.(28) R2 .....6.20
Weirton,W.Va. W6 ....6.15

SHEETS, Aluminum Coated

Butler,Pa. A10 .....8.625

SHEETS, Enameling Iron

Ashland,Ky.(8) A10 ...5.375
Cleveland R2 .....5.375
Gary,Ind. U5 .....5.375
GraniteCity,Ill. G4 ....5.575
Ind.Harbor,Ind. I-2 ....5.375
Irvin,Pa. U5 .....5.375
Middletown,O. A10 .....5.375
Niles,O. N12 .....5.375
Youngstown Y1 .....5.375

BLUED STOCK, 29 ga.

Follansbee,W.Va. F4 ..7.375
Follansbee(23) F4 .....8.60
Yorkville,O. W10 .....7.375

SHEETS, Long Terne Steel
(Commercial Quality)

BeechBottom,W.Va. W10 8.85
Gary,Ind. U5 .....8.85
Mansfield,O. E6 .....8.85
Middletown,O. A10 ....8.85
Niles,O. N12 .....8.85
Weirton,W.Va. W6 ....8.85

SHEETS, Long Terne, Ingot Iron

Middletown,O., A10 ....6.20

Key to Producers

A1 Acme Steel Co.
A2 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div. Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C31 Chester Blast Furnaces Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co
D9 Wilbur B. Driver Co.

E1 Eastern Gas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Frets-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft.Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.
M16 Md. Fine&Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman&Scott

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div.
N5 Nelson Steel & Wire Co.
N6 NewEng. HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Nrthwst.Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P3 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P23 Pacific Steel Rolling

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless WeldedProducts
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.

T3 Tenn. Coal & Iron Div.
T5 Tenn.Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan.San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W.Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ...4.00
Allenport,Pa. P7 .....4.05
Alton,Ill. L1 .....4.225
Ashland,Ky.(8) A10 ....4.00
Atlanta A11 .....4.25
Bessemer,Ala. T2 .....4.05
Birmingham C15 .....4.05
Bridgeport,Conn.(10)S15 4.05
Buffalo(27) R2 .....4.05
Conshohocken,Pa. A3 ...4.10
Detroit M1 .....4.15
Ecorse,Mich. G5 .....4.15
Fairfield,Ala. T2 .....4.05
Fontana,Calif. K1 .....4.825
Gary,Ind. U5 .....4.05
Houston,Tex.(9) S5 ...4.30
Ind.Harbor,Ind. I-2, Y1.4.05
Johnstown,Pa.(25) B2 ..4.05
KansasCity,Mo.(9) S5 ..4.30
Lackaw'na,N.Y.(25) B2.4.05
LosAngeles(25) B3 .....4.80
Milton,Pa. M18 .....4.05
Minnequa,Colo. C10 ....5.15
NewBritain(10) S15 ....4.05
N.Tonawanda,N.Y. B11..4.05
Pittsburg,Calif. C11 ....4.80
Portsmouth,O. P12 .....4.05
Riverdale,Ill. A1 .....4.05
SanFrancisco S7 .....5.00
Seattle(25) B3, P23 ....5.00
Seattle N14 .....5.05
Sharon,Pa. S3 .....4.05
So.Chicago,Ill. W14 ....4.05
So.SanFrancisco(25) B3.4.80
SparrowsPoint,Md. B2 ..4.05
Sterling(1) N15 .....4.05
Sterling,Ill. N15 .....4.15
Torrance,Calif. C11 ....4.80
Warren,O. R2 .....4.05
Weirton,W.Va. W6 .....4.05
Youngstown U5 .....4.05

STRIP, Hot-Rolled Alloy

Bridgeport,Conn.(10)S15 6.45
Carnegie,Pa. S18 .....6.70
Fontana,Calif. K1 .....6.10
Gary,Ind. U5 .....6.70
Houston,Tex. S5 .....6.95
Ind.Harbor,Ind. Y1 .....6.70
KansasCity,Mo. S5 .....6.95
LosAngeles B3 .....7.90
NewBritn.,Conn.(10)S15 6.45
Newport Ky. N9 .....6.70
Seattle P23 .....7.80
Sharon,Pa. S3 .....6.70
So.Chicago W14 .....6.70
Youngstown U5, Y1 ....6.70

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2 .....6.15
Conshohocken,Pa. A3 ..6.15
Ecorse,Mich. G5 .....6.25
Fairfield,Ala. T2 .....6.15
Fontana,Calif. K1 .....7.25
Gary,Ind. U5 .....6.15
Houston S5 .....6.55
Ind.Harbor,Ind. I-2, Y1.6.15
KansasCity,Mo. S5 .....6.75
Lackawanna,N.Y. B2 ...6.15
LosAngeles(25) B3 .....6.90
Seattle(25) B3, P23 ....7.15
Sharon,Pa. S3 .....6.15
So.SanFrancisco(25) B3.6.90
SparrowsPoint,Md. B2 ..6.15
Warren,O. R2 .....6.15
Weirton,W.Va. W6 .....6.15
Youngstown U5, Y1 ....6.15

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ....4.30
Warren,O. R2 .....4.65

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 .....5.75
Baltimore T6 .....5.75
Bridgeport,Conn.(10)S15 5.75
Cleveland A7, J5 .....5.75
Conshohocken,Pa. A3 ..5.80
Dearborn,Mich. D3 ....5.85
Detroit P20 .....5.90
Detroit I12 .....5.85
Detroit M1 .....5.85
Dover,O. G6 .....5.75
Ecorse,Mich. G5 .....5.85
Follansbee,W.Va. F4 ...5.75
Fontana,Calif. K1 .....7.60
Franklin Park,Ill. T6 ....5.85
Ind.Harbor,Ind. I-2 ....5.85
Ind.Harbor,Ind. Y1 ....5.75
Indianapolis C8 .....5.90
Lackawanna,N.Y. B2 ...5.75
LosAngeles C1 .....7.80
Mattapan,Mass. T6 .....6.30
Middletown,O. A10 .....5.75
NewBedford,Mass. R10..6.20
NewBritain(10) S15 ....5.75
NewCastle,Pa. B4, E5 ..5.75
NewHaven,Conn. A7 ....6.50
NewHaven,Conn. D2 ....6.20
Pawtucket,R.I. R2 .....6.40
Pawtucket,R.I. N8 .....6.30
Pittsburgh J5 .....5.75
Portsmouth,O. P12 .....5.75
Riverdale,Ill. A1 .....5.85
Rome,N.Y.(32) R6 .....5.75
Sharon,Pa. S3 .....5.75
Warren,O. B9, R2, T5..5.75
Weirton,W.Va. W6 .....5.75
Worcester,Mass. A7 ....6.60
Youngstown C8, Y1 ....5.75

STRIP, Cold-Rolled Alloy

Carnegie,Pa. S18 .....12.45
Cleveland A7 .....12.45
Dover,O. G6 .....12.45
Fontana,Calif. K1 .....14.55
Franklin Park,Ill. T6 ...12.45
Harrison,N.J. C18 .....12.45
Mattapan,Mass. T6 ....12.80
Pawtucket,R.I. N8 .....12.80
Sharon,Pa. S3 .....12.45
Worcester,Mass. A7 ....12.75
Youngstown C8 .....12.90

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland A7, J5 .....5.60
Dearborn,Mich. D3 ....5.70
Dover,O. G6 .....5.60
Ecorse,Mich. G5 .....5.70
Ind.Harbor,Ind. Y1 ....5.60

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	5.75	8.35	9.30	11.45	14.15
Bridgeport,Conn.(10) S15.	5.75	8.00	9.00	11.15	13.85
Bristol,Conn. W1	...	...	9.30	11.45	....
Carnegie,Pa. S18	...	6.05	9.00	11.15	13.85
Cleveland A7	5.75	8.00	9.00	11.15	13.85
Cleveland C7	...	8.05	9.00	11.15	13.85
Dearborn,Mich. D3	5.85	8.25	9.20	....	....
Detroit D2	5.95	8.25	9.20	10.95	....
Dover,O. G6	5.85	8.05	9.00	11.15	13.85
Franklin Park,Ill. T6	5.85	8.05	9.00	11.15	13.85
Harrison,N.J. C18	...	...	9.30	11.45	14.15
Indianapolis C8	6.00	8.20	9.00	11.15	13.85
Mattapan, Mass. T6	6.30	8.35	9.30	11.45	14.15
NewBritn.,Conn.(10) S15.	5.75	8.05	9.00	11.15	13.85
NewCastle,Pa. B4	5.75	8.05	9.00	11.15	....
NewCastle,Pa. E5	5.75	8.05	9.00	11.15	13.85
NewHaven,Conn. D2	6.20	8.35	9.30	11.25	....
New York W3	...	8.35	9.30	11.45	14.15
Pawtucket,R.I. N8	6.20	8.35	9.30	11.45	14.15
Riverdale,Ill. A1	5.85	8.00	9.00	11.15	13.85
Rome,N.Y.(32) R6	5.75	8.05	9.00	10.95	13.25
Sharon,Pa. S3	5.75	8.05	9.00	11.15	13.85
Trenton,N.J. R5	...	8.35	9.30	11.45	14.15
Wallingford,Conn. W2	6.20	8.35	9.30	11.45	14.15
Warren,O. T5	5.75	8.00	9.00	11.15	13.85
Weirton,W.Va. W6	5.75	8.05	9.00	11.15	13.85
Worcester,Mass. A7, T6..	6.60	8.35	9.30	11.45	14.15
Youngstown C8	5.85	8.00	9.00	11.15	13.85
Spring Steel (Tempered)					
Bristol,Conn. W1	...	...	12.90	15.60	....
Buffalo W12	...	...	12.90	....	....
Franklin Park,Ill. T6	...	...	13.40	16.10	19.50
Harrison,N.J. C18	...	...	12.90	15.60	19.00
New York W3	...	...	12.90	15.60	19.00
Trenton,N.J. R5	...	...	12.90	15.60	19.00
Worcester,Mass. A7, T6..	...	...	12.90	15.60	19.00
Worcester,Mass. W12	...	...	12.90	....	....
Youngstown C8	...	...	13.25	15.95	19.35

Lackawanna,N.Y. B2 ..5.425
Pittsburgh J5 .....5.60
Sharon,Pa. S3 .....5.60
SparrowsPoint,Md. B2..5.425
Warren,O. R2 .....5.60
Weirton,W.Va. W6 .....5.60
Youngstown Y1 .....5.60

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....6.35

STRIP, Electrogalvanized

Cleveland A7 .....5.75*
Dover,O. G6 .....5.75*
Riverdale,Ill. A1 .....5.85*
Youngstown C8 .....5.75*
Warren,O. B9, T5 .....5.75*
Weirton,W.Va. W6 ....5.75*
Worcester,Mass. A7 ..6.60*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon,Pa. S3 .....6.15
Warren,O. B9 .....6.15

TIGHT COOPERAGE HOOP

Atlanta A11 .....4.775
Riverdale,Ill. A1 .....4.625
Sharon,Pa. S3 .....4.475
Youngstown U5 .....4.475

SILICON STEEL

H.R. SHEETS (22 Ga., cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	...	9.10	10.10	11.00
Brackenridge,Pa. A4	....	...	9.10	10.10	11.00
Mansfield,O. E6	8.025	8.80	9.10	10.10	11.00
Newport,Ky. N9	8.025	8.80	9.10	10.10	11.00
Niles,O. N12	8.025	8.80	9.10	10.10	....
Vandergrift,Pa. U5	....	8.80	9.10	10.10	11.00
Warren,O. R2	8.025	8.80	9.10	10.10	11.00
Zanesville,O. A10	....	8.80	9.10	10.10	11.00

C.R. COILS & CUT LENGTHS, (22 Ga.) Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge,Pa. A4	....	....	9.50	10.85	11.75
GraniteCity,Ill. G4	8.425*‡	8.95*	9.50*‡	10.85*	....
IndianaHarbor,Ind. I-2	8.225	8.75*	9.25*	....	....
Vandergrift,Pa. U5	....	9.25†‡	9.55‡	10.85‡	11.75†
Vandergrift,Pa. U5	8.225*‡	8.75*‡	9.25*‡	10.35*‡	11.25*‡
Warren,O. R2	8.225†‡	9.25	9.55	10.85	11.75
Zanesville,O. A10	....	9.25	9.55	10.85	11.75

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	11.95	12.50	13.00	14.00
Brackenridge,Pa. A4	11.95	....	....	....
Newport,Ky. N9	11.95	....	....	....
Vandergrift,Pa. U5	11.95‡	12.50‡	13.00‡	14.00‡
Zanesville,O. A10	11.95‡	12.50‡	13.00‡	14.00‡

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-72
Brackenridge,Pa. A4	....	15.00	16.60	17.10	....
Butler,Pa. A10	....	....	16.60	17.10	....
Vandergrift,Pa. U5	14.00	15.00	16.60	17.10	12.70‡
Warren,O. R2	....	....	....	....	12.70‡

* Semiprocessed. † Fully processed only. ‡ Coils annealed; semiprocessed ½c lower. ‖ Coils, ¼-cent higher.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.50	$7.75	$8.15
Fairfield,Ala. T2	7.50	7.55	8.25
Fairless,Pa. U5	7.60	7.85	8.25
Gary,Ind. U5	7.50	7.75	8.15
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.50	7.75	8.15
Irvin,Pa. U5	7.50	7.75	8.15
Niles,O. R2	7.50	7.75	8.15
Pittsburg,Calif. C11	8.25	8.50	8.90
SparrowsPoint,Md. B2	7.60	7.85	8.25
Weirton,W.Va. W6	7.50	7.75	8.15
Yorkville,O W10	7.50	7.75	8.15
ELECTROTIN (23-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	6.175	....	....
Niles,O. R2	6.175	6.375	6.575

TIN PLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.80	$9.05
Fairfield,Ala. T2	8.90	9.15
Fairless,Pa. U5	8.90	9.15
Gary,Ind. U5	8.80	9.05
Ind.Har. I-2, Y1..	8.80	9.05
Irvin,Pa. U5	8.80	9.05
Pitts.,Cal. C11	9.55	9.80
Sp.Pt.,Md. B2	8.90	9.15
Warren,O. R2	8.80	9.05
Weirton,W.Va. W6	8.80	9.05
Yorkville,O. W10	8.80	9.05

BLACK PLATE (Base Box)

Aliquippa,Pa. J5 .....$8.60
Fairfield,Ala. T2 .....8.70
Fairless,Pa. U5 .....8.70
Gary,Ind. U5 .....8.60
GraniteCity,Ill. G4 ....8.70
Ind.Harbor,Ind. I-2, Y1.8.60
Irvin,Pa. U5 .....8.60
Niles,O. R2 .....8.60
Pittsburg,Calif. C11 ....7.35
SparrowsPoint,Md. B2...8.70
Warren,O. R2 .....8.60
Weirton,W.Va. W6 .....8.60
Yorkville,O. W10 .....8.60

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4 ..6.20
Gary,Ind. U5 .....6.20
GraniteCity,Ill. G4 ....6.20
Ind.Harbor,Ind. Y1 ....6.20
Irvin,Pa. U5 .....6.20
Yorkville,O. W10 .....6.20

MANUFACTURING TERNES (Special Coated; Base Box)

Gary,Ind. U5 .....$7.85
Irvin,Pa. U5 .....7.85
Yorkville,O. W10 .....7.85

MANUFACTURING TERNES (Light Coated, 6 lb; Base Box)

Yorkville,O. W10 .....$5.75

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5 .....5.85

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ...5.75
Aliquippa,Pa. J5 .....5.75
Alton,Ill. L1 .....5.925
Atlanta A11 .....5.95
Bartonville,Ill. K4 .....5.85
Buffalo W12 .....5.75
Chicago W13 .....5.75
Cleveland A7, C20 .....5.75
Crawfordsville,Ind. M8..5.86
Donora,Pa. A7 .....5.75
Duluth,Minn. A7 .....5.75
Fairfield,Ala. T2 .....5.75
Fostoria,O.(24) S1 .....5.95
Houston S5 .....6.00
Jacksonville,Fla. M8 ....6.27
Johnstown,Pa. B2 .....5.75
Joliet,Ill. A7 .....5.75
KansasCity,Mo. S5 .....6.00
Kokomo,Ind. C16 .....5.85
LosAngeles B3 .....6.70
Minnequa,Colo. C10 ....6.00
Monessen,Pa. P7 .....5.75
Newark 6-8 ga. I-1 ....6.40
No.Tonawanda B11 ....5.75
Palmer,Mass. W12 .....6.05
Pittsburg,Calif. C11 ....6.70
Portsmouth,O. P12 .....5.75
Rankin,Pa. A7 .....5.75
So.Chicago,Ill. R2 .....5.75
So.SanFrancisco C10 ....6.70
SparrowsPoint,Md. B3 ..5.85
Sterling,Ill.(1) N15 ....5.75
Sterling,Ill. N15 .....5.85
Struthers,O. Y1 .....5.75
Waukegan,Ill. A7 .....5.75
Worcester,Mass. A7 ....6.05

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5 .....7.20
Alton,Ill. L1 .....7.375
Bartonville,Ill. K4 .....7.30
Buffalo W12 .....7.20
Cleveland A7 .....7.20
Donora,Pa. A7 .....7.20
Duluth,Minn. A7 .....7.20
Fostoria,O. S1 .....7.20
Johnstown,Pa. B2 .....7.20
LosAngeles B3 .....8.15
Millbury,Mass.(12) N6 ..7.50
Minnequa,Colo. C10 ....7.45
Monessen,Pa. P7, P16...7.20
Muncie,Ind. I-7 .....7.40
Palmer,Mass. W12 .....7.50
Pittsburg,Calif. C11 ....8.15
Portsmouth,O. P12 .....7.20
Roebling,N.J. R5 .....7.50
So.Chicago,Ill. R2 .....7.20
So.SanFrancisco C10 ...8.15
SparrowsPt.,Md. B2 ....7.30
Struthers,O. Y1 .....7.20
Trenton,N.J. A7 .....7.50
Waukegan,Ill. A7 .....7.20
Worcester A7,J4,T6,W12 7.50

WIRE, Upholstery Spring

Aliquippa,Pa. J5 .....6.90
Alton,Ill. L1 .....7.075
Buffalo W12 .....6.90
Cleveland A7 .....6.90
Donora,Pa. A7 .....6.90
Duluth,Minn. A7 .....6.90
Johnstown,Pa. B2 .....6.90
KansasCity,Mo. S5 .....7.60
LosAngeles B3 .....7.85
Minnequa,Colo. C10 ...7.075
Monessen,Pa. P7, P16...6.90
NewHaven,Conn. A7 ....7.20
Palmer,Mass. W12 .....7.20
Pittsburg,Calif. C11 ....7.85
Portsmouth,O. P12 .....6.90
Roebling,N.J. R5 .....7.20
So.Chicago,Ill. R2 .....6.90
So.SanFrancisco C10 ...7.85
SparrowsPoint,Md. B2 ..7.00
Struthers,O. Y1 .....6.90
Trenton,N.J. A7 .....7.20
Waukegan,Ill. A7 .....6.90
Worcester,Mass. A7 ....7.20

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1 .....11.375
Bartonville,Ill. K4 .....11.30
Buffalo W12 .....11.20
Chicago W13 .....11.20
Cleveland A7 .....11.20
Crawfordsville,Ind. M8.11.30
Fostoria,O. S1 .....11.20
Jacksonville,Fla. M8 ...11.73
Johnstown,Pa. B2 .....11.20
Kokomo,Ind. C16 .....11.20
Minnequa,Colo. C10 ....10.98
Monessen,Pa. P16 .....11.20
Muncie,Ind. I-7 .....11.40
Palmer,Mass. W12 .....11.50
Roebling,N.J. R5 .....11.50
So.SanFrancisco C10 ...11.55
Waukegan,Ill. A7 .....11.20
Worcester,Mass. A7,T6.11.50

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4 .....9.90
Buffalo W12 .....9.90
Johnstown,Pa. B2 .....9.90
Minnequa,Colo. C10 ..10.025
Monessen,Pa. P16 .....9.90
Muncie,Ind. I-7 .....10.10
Portsmouth,O. P12 .....9.90
Roebling,N.J. R5 .....10.20
SparrowsPt.,Md. B2 ...10.00

ROPE WIRE (A)

Alton,Ill. L1 .....9.75
Bartonville,Ill. K4 .....9.75
Buffalo W12 .....9.75
Fostoria,O. S1 .....9.75
Johnstown,Pa. B2 .....9.75
Monessen,Pa. P7, P16 ..9.75
Muncie,Ind. I-7 .....9.95
Palmer,Mass. W12 .....10.05
Portsmouth,O. P12 .....9.75
Roebling,N.J. R5 .....10.05
SparrowsPt. B2 .....9.85
Struthers,O. Y1 .....9.75
Worcester J4, T6 .....9.65

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE
(Continued)

WIRE, Tire Bead

Alton,Ill L1	13.25
Bartonville,Ill. K4	13.25
Monessen, Pa. P14	13.15
Portsmouth,O. P12	13.15
Roebling,N.J. R5	13.45

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	7.95
Baltimore T6	8.25
Buffalo W12	7.95
Cleveland A7	7.95
Crawfordsville,Ind. M8	8.05
Dover,O. G6	7.95
Fostoria,O. S1	7.95
FranklinPark,Ill. T6	8.05
Kokomo,Ind. C16	8.05
Massillon,O. R5	7.95
Milwaukee C23	8.15
Monessen,Pa. P7, P16	7.95
Pawtucket,R.I. N8	8.25
Rome,N.Y.(32) R6	7.95
Trenton,N.J. R5	8.25
Worcester A7, T6, W12	8.25

WIRE, Merchant Quality
(6 to 8 gage) An'ld Galv.

Ala.City,Ala. R2	6.90 7.30**
Aliquippa J5	6.90 7.425‡
Atlanta A11	7.00 7.55
Bartonville(48) K4	7.00 7.55
Buffalo W12	6.90 7.30†
Cleveland A7	6.90 ....
Crawfordsville M8	7.00 7.55
Donora,Pa. A7	6.90 7.30†
Duluth,Minn. A7	6.90 7.30†
Fairfield T2	6.90 7.30†
Houston,Tex. S5	7.15 7.55†
Jacksonville,Fla. M8	7.425 7.85
JohnstownB2(48)	6.90 7.45*
Joliet,Ill. A7	6.90 7.30†
KansasCity,Mo. S5	7.15 7.55†
Kokomo C16	7.00 7.40†
LosAngeles B3	7.85 ....
Minnequa C10	7.15 7.55**
Monessen P7 (48)	6.90 7.45
Palmer W12	7.20 7.60†
Pitts.,Calif. C11	7.85 8.25†
Portsmouth,O. P12	6.90 ....
Rankin A7	6.90 7.30†
So.Chicago R2	6.90 7.30**
S.S.Fran. C10	7.85 8.25**
SparrowsPt.B2(48)	7.00 7.55*
Sterling(1)(48)N15	6.90 7.45
Struthers,O.(48)Y1	6.90 7.40‡
Worcester A7	7.20 ....

*Based on 11c zinc; †5c zinc; ‡ Less than 10c zinc; **Subject to zinc equalization extras.

WOVEN FENCE, 9-15½Ga. Col.

Ala.City,Ala. R2	146**
Ala.City, 17 ga. R2	241**
Ala.City, 18 ga. R2	251**
Aliq'ppa,Pa.9-14½ga.J5	149‡
Atlanta A11	151
Bartonville,Ill. K4	151
Crawfordsville,Ind. M8	151
Donora,Pa. A7	146†
Duluth,Minn. A7	146†
Fairfield,Ala. T2	146†
Houston,Tex. S5	151†
Johnstown,Pa.(48) B2	149
Joliet,Ill. A7	146†
KansasCity,Mo. S5	151†
Kokomo,Ind. C16	148†
Minnequa,Colo. C10	154**
Monessen,Pa. 9 ga. P17	149
Pittsburg,Calif. C11	169†
Rankin,Pa. A7	146†
So.Chicago,Ill. R2	146**
Sterling,Ill.(1) N15	149

†Based on 8c zinc; *11c zinc; ‡ 10c zinc; **Subject to zinc equalization extras.

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	155
Atlanta A11	157
Bartonville,Ill. K4	157
Crawfordsville,Ind. M8	157
Donora,Pa. A7	156
Duluth,Minn.A7	155
Fairfield,Ala. T2	158
Joliet,Ill. A7	155
Houston S5	160
KansasCity,Mo. S5	160
Kokomo,Ind C16	157
Minnequa,Colo. C10	160
Pittsburg,Calif. C11	179
So.Chicago,Ill. R2	155
So.SanFran.,Calif. C10	179
SparrowsPoint,Md. B2	157
Sterling,Ill.(1) N15	155

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	159**
Aliquippa J5	156‡
Atlanta A11	164
Bartonville,Ill. K4	164
Crawfordsville,Ind. M8	164
Donora,Pa. A7	159†
Duluth,Minn. A7	159†
Fairfield,Ala. T2	159†
Houston,Tex. S5	164†
Johnstown,Pa. B2	162*
Joliet,Ill. A7	159†
KansasCity,Mo. S5	164†
Kokomo,Ind. C16	161†
Minnequa,Colo. C10	165**
Monessen,Pa. P7	162
Pittsburg,Calif. C11	179†
Rankin,Pa. A7	159†
So.Chicago,Ill. R2	159**
S.SanFrancisco C10	179**
SparrowsPoint,Md. B2	164*
Sterling,Ill. (1) N15	162

† Based on 5c zinc; *11c zinc; ‡10c zinc; **Subject to zinc equalization extras.

WIRE (16 gage)	An'ld Galv.	Stone Stone
Ala.City R2	13.15	14.70**
Bartonville K4	13.25	15.10
Buffalo W12	13.15	....
Cleveland A7	13.15	....
Crawfrdsville M8	13.25	15.10
Fostoria,O. S1	13.25	14.80†
Johnstown B2	13.15	15.00*
Kokomo C16	13.25	14.80†
Minnequa C10	13.40	15.10**
Palmer,Mas.W12	13.15	14.70†
Pitts.,Calif. C11	13.50	15.05†
So.Chicago R2	13.15	14.70
SparrowsPt. B2	13.25	15.10*
Sterling(1) N15	13.15	15.00
Waukegan A7	13.15	14.70†
Worcester A7	13.45	....

* Based on 11c zinc; † 5c zinc; ‡ 10c zinc; **Subject to zinc equalization extras.

NAILS, Stock
To dealers & mfrs. (7) Col.

AlabamaCity,Ala. R2	137
Aliquippa,Pa. J5	137
Atlanta A11	139
Bartonville,Ill. K4	139
Chicago,Ill. W13	137
Cleveland A9	142
Crawfordsville,Ind. M8	139
Donora,Pa. A7	137
Duluth,Minn. A7	137
Fairfield,Ala. T2	137
Galveston,Tex. D7	139
Houston,Tex. S5	142
Johnstown,Pa. B2	137
Joliet,Ill. A7	137
KansasCity,Mo. S5	142
Kokomo,Ind. C16	139
Minnequa,Colo. C10	142
Monessen,Pa. P7	137
Pittsburg,Calif. C11	156
Rankin,Pa. A7	137
So.Chicago,Ill. R2	137
SparrowsPt.,Md. B2	139
Sterling,Ill.(1) N15	137
Worcester,Mass. A7	143

NAILS, CUT (100 lb keg)
To dealers (33)

Conshohocken,Pa. A3	$3.30
Wheeling,W.Va. W10	3.30

STAPLES, Polished Stock
To dealers & mfrs. (7) Col.

Aliquippa,Pa. J5	138
Atlanta A11	140
Bartonville,Ill. K4	139
Crawfordsville,Ind. M8	139
Donora,Pa. A7	138
Duluth,Minn. A7	138
Fairfield,Ala. T2	138
Johnstown,Pa. B2	136
Joliet,Ill. A7	138
Kokomo,Ind. C16	139
Minnequa,Colo. C10	143
Monessen,Pa. P7	137
Pittsburg,Calif. C11	157
Rankin,Pa. A7	138
SparrowsPt.,Md. B2	140
Sterling,Ill. (1) N15	137
Worcester,Mass. A7	144

TIE WIRE, Automatic Baler
(14½ Ga.) (Per 97 lb Net Box)

Coil No. 3150

Donora,Pa. A7	$8.77
Duluth,Minn. A7	8.77
Joliet,Ill. A7	8.77

Coil No. 6500 Stand.

Donora,Pa. A7	$9.06
Duluth,Minn. A7	9.06
Joliet,Ill. A7	9.06

Coil No. 6500 Interim

Donora,Pa. A7	$9.10
Duluth,Minn. A7	9.10
Joliet,Ill. A7	9.10

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS
(Base discounts, per cent off list, f.o.b. midwestern plants)

4 in. and shorter:	
⅛-in. & smaller diam	2
Over 4 in. through 6 in.:	
⅛ in. & smaller diam	+3
6 in. and shorter:	
⅞-in. and ⅞-in.	+4
1 in. and larger	+6
Longer than 6 in.:	
All diameters	+15
Lag bolts, all diams.:	
6 in. and shorter	6
Over 6 in. long	+2
Ribbed Necked Carriage	+4
Blank	10
Plow	23
Step, Elevator, Tap and Sleigh Shoe	10
Tire Bolts	+3
Boiler & Fitting-Up Bolts	21

NUTS

H.P. and C.P., regular & heavy:	
Square, all sizes	55
H.P., Hex, regular & heavy:	
⅝" and smaller	55
⅞" to 1¼", inclusive	58
1⅜" to 1½", inclusive	60
1⅝" and larger	55
C.P. Hex regular & heavy:	
All sizes	55
Hot Galv. Nuts (all types):	
⅝" or smaller	39
⅞" to 1½", inclusive	41
Finished Hex Nuts:	
New standard, all sizes	55
Semifinished & Slotted Hex:	
Regular and heavy, all sizes	55

SQUARE HEAD SET SCREWS
(1035 steel; packaged; per cent off list)

1 in. diam. x 6 in. and shorter	34
1 in. and smaller diam. x over 6 in.	20

HEADLESS SET SCREWS
(Packaged; per cent off list)

No. 10 and smaller	34
¼ in. diam. & larger	14
N.F. thread, all diams.	8

STEEL STOVE BOLTS
(F.o.b. plant, per cent off list in packages)

Plain finish	43
Plated finishes	23

HEXAGON CAP SCREWS
(1030 steel; packaged; per cent off list)

6 in. or shorter:	
¼ in. through ⅝-in.	33
⅝-in. through 1 in.	13
Longer than 6 in.:	
¼-in. through ⅝-in.	29
⅝-in. through 1 in.	7

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 9.25
⅞-in. under..List less 37%

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	19.50	19.00
1¼	13	....	23.21	18.77
1½	13	21.40	25.65	20.75
1¾	13	25.28	30.31	24.53
2	13	28.23	33.97	27.48
2¼	13	31.91	38.26	30.95
2½	13	34.63	41.52	33.59
2¾	12	38.15	45.74	37.00
2¾	13	41.31	49.53	40.07
3	12	44.05	52.82	43.73

RAILWAY MATERIALS

	Std. No. 1	Std. No. 2	Std. Too Rails All No. 2	Std. Too Rails 60 lb Under
RAILS				
Bessemer,Pa. U5	4.45	4.35	4.40	5.35
Ensley,Ala. T2	4.45	4.35	...	5.35
Fairfield,Ala. T2	...	...	...	5.35
Gary,Ind. U5	4.45	4.35	4.40	...
IndianaHarbor,Ind. I-2	4.45	4.35	4.40	...
Johnstown,Pa. B2	...	...	...(16)	5.35
Lackawanna,N.Y. B2	4.45	4.35	...	5.35
Minnequa,Colo. C10	4.45	4.35	...	5.35
Steelton,Pa. B2	4.45	4.35	...	5.35
Williamsport,Pa. S19	...	...	...	5.35

TIE PLATES

Fairfield,Ala. T2	5.275
Gary,Ind. U5	5.275
Ind.Harbor,Ind. I-2	5.275
Lackawanna,N.Y. B2	5.275
Minnequa,Colo. C10	5.275
Seattle B3	6.425
Steelton,Pa. B2	5.275
Torrance,Calif. C11	5.425

TRACK BOLTS (20) Treated

Cleveland R3	11.80
KansasCity,Mo. S5	11.80
Lebanon,Pa. B2	11.80
Minnequa, Colo. C10	11.80
Pittsburgh O3, P14	11.80
Seattle B3	12.00

AXLES

Ind.Harbor,Ind. S13	6.75
Johnstown,Pa. B2	6.75

JOINT BARS

Bessemer,Pa. U5	6.425
Fairfield,Ala. T2	6.425
Ind.Harbor,Ind. I-2	6.425
Joliet,Ill. U5	6.425
Lackawanna,N.Y. B2	6.425
Minnequa,Colo. C10	6.425
Steelton,Pa. B2	6.425

SCREW SPIKES

Cleveland R2	11.00

STANDARD TRACK SPIKES

Fairfield,Ala. T2	7.30
Ind.Harbor,Ind. I-2, Y1	7.30
KansasCity,Mo. S5	7.30
Lebanon,Pa. B2	7.30
Minnequa,Colo. C10	7.30
Pittsburgh J5	7.30
Seattle B3	7.50
So.Chicago,Ill. R3	7.30
Struthers,O. Y1	7.30
Youngstown R3	7.30

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron: 98+% Fe, annealed	15.35
Unannealed:	
Minus 100 mesh	11.75
Minus 35 mesh	9.35
Minus 20 mesh	9.60
Swedish, c.i.f. N.Y., c.l., in bags	11.25
Domestic (Swedish), f.o.b. Riverton, N. J., in bags	9.50
Electrolytic iron:	
Melting stock, 99.91% Fe, irregular fragments of ¼ in. x 1.3 in.	22.00
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	32.50
Unannealed (99+% Fe) (minus 325 mesh)	32.00
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl iron: 97.9-99.8% size 5 to 15 microns—$2.00-146.00	
Aluminum:	
Atomized, 500 lb drums, frgt. allowed:	
Carlots	35.00
Ton lots	32.00
Antimony, 500 lb lots	22.00*
Brass, 5000-lb lots	29.75-57.25†
Bronze, 5000-lb lots	48.75-82.00†
Copper:	
Electrolytic	13.75*
Reduced	13.75*
Lead	7.50*
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel, unannealed	94.00
Nickel-Silver, 5000-lb lots	45.50‡
Nickel-Silver, 5000-lb lots	49.00**
Phosphor-Bronze, ¼-ton lots	56.50
Silicon	43.50
Solder	7.00*
Stainless Steel, 302	91.00
Tin	14.50*
Zinc, 5000-lb lots 17.25-21.00‡	
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	4.95
Less than 1000 lb	5.10
Chromium, electrolytic 99.2% Cr min.	3.50

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 30% Zn, 10% Ni; **64% Cu 18% Zn, 18% Ni.

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅝" to 1 17/16"; 1 17/16" to 1 15/16" 4.75c; 1 15/16" to 7 5/16" 5.15c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.35c for 17 Ga. & heavier.
(14) Gage 0.142 to 0.249 in.; for gage 0.143 and lighter, 5.80c.
(15) ⅝" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25 off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 26" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 4.95c.
(27) Bar mill sizes.
(28) Sendzimir.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon, add 0.40c for alloy and 0.35c H.S.-L.A.
(31) Widths over ⅝-in.; 0.40c for widths ⅝-in. and under by 0.135 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 gage & heavier; 60" & narrower.
(38) 14 gage & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.20c higher.
(41) 2 10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. to mill area or within switching limits, 5.10c.
(43) 0-14½ gage.
(45) 0-7 gage.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Ambridge, Pa. N2	13.5	...	17.5	...	20	...	21.5	...	21.5	...	20.75	...	23.25	...
Lorain, O. N3	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Youngstown Y1	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		8c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Alton, Ill. L1	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Benwood, W. Va. W10	24	+4.5	15.25	+10.25	7.25	+17.25	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Butler, Pa. F8	25	+3.5	17	+8.5	9.5	+15	....	..	....	...	....	..	....	....
Etna, Pa. N2	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Fairless, Pa. N3	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Fontana, Calif. K1	...	...	....	....	....	....	10.75	+6.5	13.75	+2.5	16.25	1	18.75	2.25
Ind. Harbor, Ind. Y1	...	...	....	....	....	....	22.75	5.5	25.75	9.5	28.25	13	30.75	14.25
Lorain, O. N3	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sharon, Pa. S4	25	+3.5	17	+8.5	9.5	+15	....	..	....	...	....	..	....	....
Sharon, Pa. M6	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sparrows Pt., Md. B2	23	+5.5	15	+10.5	7.5	+17	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Youngstown R2, Y1	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Wheatland, Pa. W9	23	+5.5	15	+10.5	7.5	+17	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Alton, Ill. L1	30.25	14.25	30.75	14.75	32.25	15	32.25	15	....	...	....	...
Benwood, W. Va. W10	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Etna, Pa. N2	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Fairless, Pa. N3	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Fontana, Calif. K1	19.25	3.25	19.75	3.75	21.25	4	21.25	4	12.5	+5.25	12.5	+5.25
Ind. Harbor, Ind. Y1	31.25	15.25	31.75	15.75	33.25	16	33.25	16	24.5	6.75	25.5	6.75
Lorain, O. N3	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Sharon, Pa. M6	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Sparrows Pt., Md. B2	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Youngstown R2, Y1	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Wheatland, Pa. W9	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75

*Galvanized pipe discounts based on current price of zinc (11.50c, East St. Louis).

Stainless Steel

(Representative prices, cents per pound; subject to current lists of extras)

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	Shapes; H.R. & C.F. H.R. Strip	Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
201	16.75	21.00	30.00	34.75	30.25	35.75	37.75	41.75	38.75
302	17.75	23.25	30.25	35.00	32.50	36.00	38.00	42.00	42.00
302B	19.00	25.00	31.00	35.00	35.50	36.00	38.00	45.25	45.25
303	....	25.25	32.75	37.75	....	38.75	40.25	46.00	46.00
304	19.00	24.50	31.75	36.75	35.00	38.00	40.50	44.50	44.50
304L	....	....	36.75	41.75	40.00	43.00	45.50	49.50	49.50
305	20.50	26.50	33.50	37.25	38.00	38.00	41.00	47.50	47.50
308	20.75	27.25	36.25	41.75	39.00	43.00	47.00	49.00	49.00
309	27.75	36.00	44.00	50.50	50.50	51.75	55.00	63.25	63.25
309S	29.75	38.75	48.00	55.75	55.25	56.75	60.25	69.75	69.75
310	32.00	45.25	58.75	68.25	64.75	69.50	71.00	74.25	74.25
314	....	....	....	....	....	....	71.00	....	....
316	29.75	38.00	48.25	56.25	55.00	57.25	60.50	64.50	64.50
316L	....	....	53.25	61.25	60.00	62.25	65.50	69.50	69.50
317	35.00	45.50	59.25	68.75	69.50	70.25	72.75	79.00	79.00
321	23.50	30.25	36.00	41.50	41.75	42.75	46.50	51.25	51.25
330	....	....	61.50	....	....	72.00	73.25	81.25	81.25
18-8CbTa	29.25	38.25	46.00	52.25	53.00	53.75	58.50	66.50	66.50
403	....	....	27.00	30.75	....	32.00	34.25	....	....
405	18.20	21.75	25.25	29.25	30.50	30.25	31.75	39.75	39.75
410	14.00	18.25	24.00	27.25	26.25	28.75	30.00	34.25	34.25
414	....	....	24.50	....	....	29.25	30.50	35.25	35.25
416	....	....	24.50	28.25	....	29.25	....	....	....
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	52.75	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	34.75	34.75
430F	....	....	25.00	28.75	....	29.75	....	....	....
431	19.00	19.25	25.00	28.75	28.00	29.75	31.00	35.75	35.75
446	....	....	33.50	38.25	50.25	39.50	40.75	59.75	59.75

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co., Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Plates, Carbon Base 10%	Plates, Carbon Base 20%	Sheets, Carbon Base 20%
Stainless:			
302	....	....	28.00
304	27.60–28.30	32.70–33.60	29.75
304-L	30.30	35.50	....
316	32.60–33.40	37.70–38.80	42.75
316-L	37.80	43.30	....
316-CB	38.90	45.50	....
321	29.30–30.00	34.40–35.30	34.25
347	30.40–32.20	38.60	44.25
405	23.40–23.90	30.60–31.10	....
410	22.90–23.40	30.10–30.60	....
430	23.40	30.60	24.25
Inconel	47.90	63.90	....
Nickel	39.50	54.10	....
Monel	40.80	54.80	....
L-Nickel	41.70	58.50	....
Copper*	....	....	46.00

	Strip, Carbon Base: Cold-Rolled 10%	Cold-Rolled Both Sides	Hot-Rolled 10%	Hot-Rolled Both Sides
Copper*	28.85	35.85	25.00	32.25

* Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S15.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.26	5% Cr Hot Work	0.405
Extra Carbon	0.31-.315	W-Cr Hot Work	0.425
Special Carbon	0.37	V-Cr Hot Work	0.445
Oil Hardening	0.405	Hi-Carbon-Cr	0.73

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	...	4.030
18.25	4.25	1	4.75	...	2.245-2.415
18	4	2	9	...	2.615
18	4	2	....	...	1.705
18	4	1	....	...	1.540
14	4	2	5	...	2.185
13.75	3.75	2	5	...	2.185
13.5	4	3	....	...	1.805
9	3.5	..	....	...	1.115
6	4	2	....	5	1.045
6	4	3	....	6	1.290
1.5	4	1	....	8.5	0.900

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

Birmingham District	Basic	No. 2 Foundry	Malleable	Bessemer
AlabamaCity,Ala. R2	$2.38	$2.88	....	....
Birmingham R2	2.38	2.88	....	....
Birmingham U6	....	2.88	56.50†	....
Gadsden,Ala. R2	2.38	2.88	....	....
Cincinnati, deld.	....	60.58	....	....
Buffalo District				
Buffalo H1, R2	56.00	56.50	57.00	57.50
Tonawanda,N.Y. W12	56.00	56.50	57.00	....
No.Tonawanda,N.Y. T9	....	56.50	57.00	57.50
Boston, deld.	66.65	67.15	67.65	....
Rochester, N.Y., deld.	59.02	59.52	60.02	....
Syracuse,N.Y., deld.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Chicago R2	56.00	....	56.50	....
Gary,Ind. U5	56.00	....	56.50	....
IndianaHarbor,Ind. I-2	56.00	....	56.50	....
So.Chicago,Ill. W14, Y1	56.00	56.50	56.50	....
So.Chicago,Ill. U5	56.00	....	56.50	57.00
Milwaukee, deld.	58.17	58.67	58.67	59.17
MuskegonMich., deld.	....	62.80	62.80	....
Cleveland District				
Cleveland A7, R2	56.00	56.50	56.50	57.00
Akron,O., deld.	58.75	59.25	59.25	59.75
Lorain,O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem,Pa. B2	58.00	58.50	59.00	59.50
New York, deld.	....	62.28	62.78	....
Newark, deld.	61.02	61.52	62.02	62.52
Birdsboro,Pa. B10	58.00	58.50	....	....
Chester,Pa. C31	....	48.50	49.00	....
Philadelphia, deld.	....	50.16	50.66	....
Steelton,Pa. B2	58.00	58.50	59.00	59.50
Swedeland,Pa. A3	58.00	58.50	59.00	59.50
Philadelphia, deld.	59.66	60.16	60.66	61.16
Troy,N.Y. R2	58.00	58.50	59.00	59.50
Pittsburgh District				
Nevillelsland,Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	57.87	57.87	58.37
McKeesRocks, deld.	....	57.54	57.54	58.04
Lawrenceville,Homestead, Wilmerding,Monaca, deld.	....	58.16	58.16	58.66
Verona,Trafford, deld.	58.19	58.69	58.69	59.19
Brackenridge, deld.	58.45	58.95	58.95	59.45
Bessemer,Pa. U5	56.00	....	56.50	57.00
Clairton,Rankin,So.Duquesne,Pa. U5	56.00	....	....	....
McKeesport,Pa. N3	56.00	....	....	57.00
Midland,Pa. C18	56.00	....	....	....

Youngstown District	Basic	No. 2 Foundry	Malleable	Bessemer
Hubbard,O. Y1	....	....	56.50	....
Sharpsville,Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U6	56.00	....	....	57.00
Mansfield,O. deld.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie,Pa. I-3	56.00	56.50	56.50	57.00
Everett,Mass. E1	60.50	61.00	61.50	....
Fontana,Calif. K1	62.00	62.50	....	....
Geneva,Utah C11	56.00	56.50	....	....
GraniteCity,Ill. G4	57.90	58.40	58.90	....
Ironton,Utah C11	56.00	56.50	....	....
LoneStar, Texas L6	52.00	52.50*	52.50	....
Minnequa,Colo. C10	58.00	59.00	59.00	....
Rockwood,Tenn. T2	....	52.50*	56.50	....
Toledo,O. I-3	56.00	56.50	56.50	57.00
Cincinnati, deld.	61.76	62.26	....	....

*Low phos. southern grade. †Phos., 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.00 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson,O. G2, J1	$65.00
Buffalo H1	66.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$80.50
Keokuk,Iowa, Openhearth & Fdry, freight allowed K2	85.00
Keokuk, OH & Fdry, 12¼ lb pigiets, 16% Si, frgt allowed K2	88.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, Intermediate A7	$61.00
Lyle,Tenn. T3	70.00
Rockwood,Tenn. T3	70.00
Steelton,Pa. B3	64.00
Philadelphia, deld.	67.55
Troy,N.Y. R2	64.00

Warehouse Steel Products

Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except Birmingham and St. Paul, 15 cents; Philadelphia, New York, Boston and Los Angeles, 10 cents; Buffalo, 25 cents on C.R. and galvanized sheets, C.F. and alloy bars and 20 cents on other commodities; Houston, Seattle, Spokane, Wash., no charge.

	SHEETS				STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	Stainless Type 302‡§	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.§	H.R. Alloy 4140‡‡*		Carbon	Floor
Baltimore	6.02	7.51	7.79	....	6.69	...	6.68	8.52¹	12.04	6.72	6.37	7.76
Birmingham	6.35	7.35	8.25¹	....	6.60	...	6.50	9.10	....	6.65	6.65	8.45
Boston	7.23	8.23	9.52	45.28¹	7.47	...	7.20	8.60	12.45	7.49	7.37	8.50
Buffalo	6.35	7.40	8.79	....	6.70	...	6.50	7.85	12.15	6.72	6.65	7.90
Charlotte, N. C.	6.95	7.80	8.69	....	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.38	7.38	8.30	46.05	6.62	...	6.51	7.50	11.90	6.69	6.52	7.64
Cincinnati	6.49	7.37	8.30	45.80	6.86	...	6.75	7.80	12.15	6.86	6.81	7.89
Cleveland	6.38	7.38	8.45	45.66	6.72	...	6.57	7.60	11.98	7.02	6.69	7.81
Detroit	6.57	7.57	8.58	43.59	6.90	7.36	6.79	7.79	12.10	7.16	6.80	7.83
Erie, Pa.	6.35	7.38	8.30	....	6.70	...	6.50	7.45¹	....	6.69	6.52	7.64
Houston	7.35	7.80	9.93	....	7.70	9.30	7.70	9.50	....	7.60	7.35	8.75
Los Angeles	7.50	9.35	9.95	50.15	7.85	11.75	7.45	10.15	13.20	7.65	7.45	9.55
Milwaukee	6.47	7.47	8.39	....	6.71	...	6.60	7.69	11.99	6.86	6.61	7.73
Moline, Ill.	6.73	7.73	8.65	....	6.97	...	6.86	7.85	....	7.04	6.87	...
New York	6.97	7.91	8.79	44.95	7.56	...	7.37	8.73¹	12.28	7.38	7.27	8.68
Norfolk, Va.	7.00	...	...	....	7.10	...	7.10	8.60	....	7.10	7.10	7.95
Philadelphia	6.19	7.44	8.26	41.98¹	6.96	8.80	6.74	8.36¹	12.10	6.54	6.49	7.51**
Pittsburgh	6.38	7.38	8.30	46.00	6.72	...	6.51	7.85	11.90	6.69	6.52	7.64
Portland, Oreg.	7.60	8.75	9.35	48.50	7.85	...	7.55	10.95	14.00	7.50	7.45	9.35
Richmond, Va.	6.43	7.39	8.67	....	6.77	...	6.71	8.33	....	7.08	6.65	8.08
St. Louis	6.67	7.67	8.59	43.59	6.91	...	6.80	7.89	12.19	7.09	6.81	7.93
St. Paul	7.04	8.04	8.96	....	7.28	...	7.17	8.26	....	7.35	7.18	8.30
San Francisco	7.55	8.95	8.70	51.65	7.80	...	7.35	10.05	13.20	7.50	7.40	9.45
Seattle	8.10	9.80	10.15	50.50	8.20	...	7.80	10.95	13.65	7.75	7.80	9.60
Spokane	8.35	9.65¹	10.05	....	7.80	...	7.80	10.85§§	14.40	7.45	7.55	9.60
Washington	6.70	7.99	7.97	....	7.37	...	7.38	9.09	....	7.31	7.05	8.16

*Prices do not include gage extras; †prices include gage and coating extras, based on 11-cent zinc except in New York, Philadelphia, Los Angeles, Cincinnati, Cleveland, Pittsburgh, San Francisco (11.50-cent zinc) and in Birmingham (coating extra excluded); ‡includes 35-cent special bar quality extra; §as rolled; **¼-in. and heavier; ††as annealed; ‡‡prices include $2 for crating; §§under ½-in.

Base quantities, 2000 to 4999 lb except as noted: Cold-rolled strip and cold-finished bars, 2000 lb and over, except in Seattle, 2000 to 9999 lb; stainless sheets, 5000 lb except in New York and Boston, 10,000 lb, and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999; ¹—500 to 9999 lb; ²—4000 lb and over; ³—1000 to 1999 lb; ⁴—1000 lb and over; ⁵—1500 lb to 3999 lb; ⁶—f.o.b. local delivery in lots of 10,000 lb and over.

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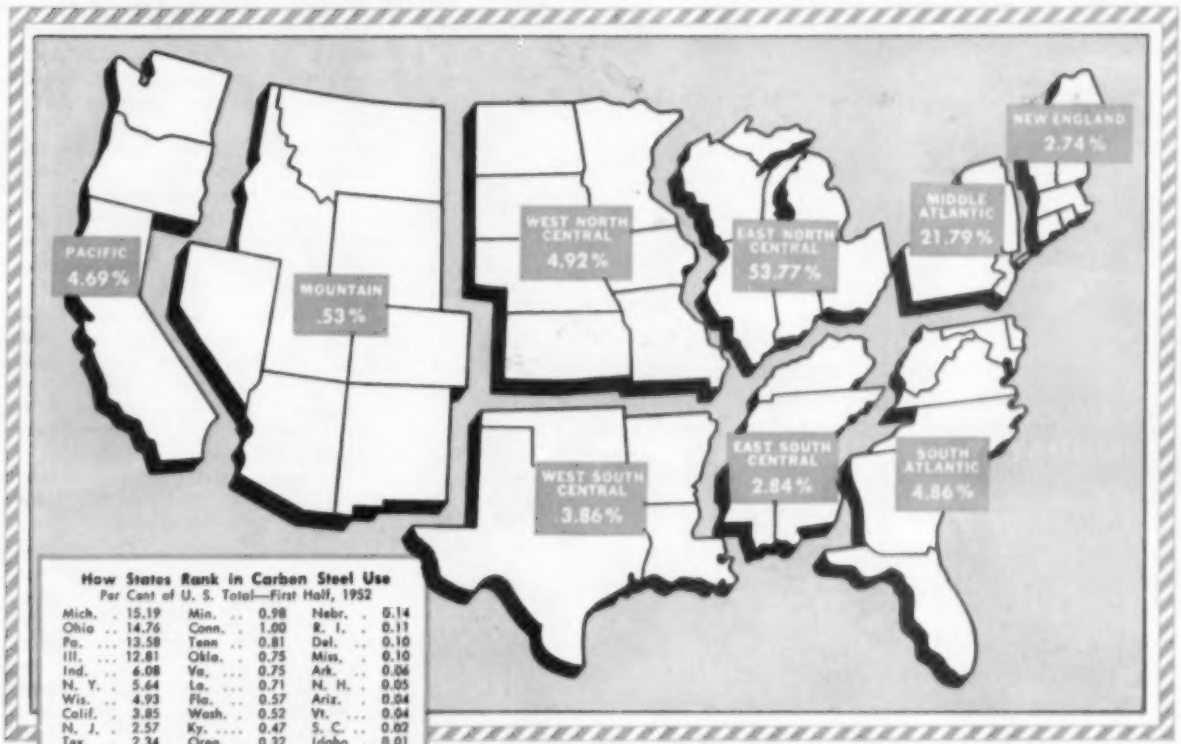

How States Rank in Carbon Steel Use
Per Cent of U. S. Total—First Half, 1952

Mich.	15.19	Min.	0.98	Nebr.	0.14
Ohio	14.76	Conn.	1.00	R. I.	0.11
Pa.	13.58	Tenn	0.81	Del.	0.10
Ill.	12.81	Okla.	0.75	Miss.	0.10
Ind.	6.08	Va.	0.75	Ark.	0.06
N. Y.	5.64	La.	0.71	N. H.	0.05
Wis.	4.93	Fla.	0.57	Ariz.	0.04
Calif.	3.85	Wash.	0.52	Vt.	0.04
N. J.	2.57	Ky.	0.47	S. C.	0.02
Tex.	2.34	Oreg.	0.32	Idaho	0.01
Mo.	2.28	Kans.	0.32	Mont.	0.01
Md.	1.71	Ga.	0.31	N.Dak.	0.01
Ala.	1.46	Utah	0.29	S.Dak.	0.01
Mass.	1.36	N. C.	0.23	Wyo.	0.01
Iowa	1.18	Me.	0.18	D. C.	0.01
W. Va.	1.16	Colo.	0.17	Nev.	*
				N.Mex.	*

U. S. Bureau of the Census
* Some used, but little.

Steel Consumers: Where They're Located

MAPPING PLANS for a new plant or new sales territories?

You may find it profitable to study the latest report on geographic consumption of ferrous and nonferrous metals.

It shows how states and sections of the United States rank as consumers of carbon steel, alloy and stainless steel, copper and copper-base alloys and aluminum. The report, issued by the U. S. Bureau of the Census, is tagged "Facts for Industry, series NPAF-1-02," and is available at U. S. Department of Commerce offices.

Translation—The government report is in terms of tons, but STEEL translates them into percentages for you in the map and table above. Not only does the government report give data on geographic consumption of metals but it provides tonnage figures on consumption of metals by five major industry groups upon which the entire report is based. Those groups and their standard industrial classification numbers are: Fabricated metal products, 34; machinery (except electrical), 35; electrical machinery, 36; transportation equipment, 37; and iron and steel forgings, 3391. Consumption by industries is shown for all of 1952, but the geographic figures are for the first half of that year.

First in Five Years—The latest report is based on 1952, but it is the first geographic data since those in the 1947 "Census of Manufactures" issued at the end of 1949.

The East North Central region continues to be the largest consumer of carbon steel mill shapes and castings. It accounts for 53.77 per cent of the consumption. Five states—Michigan, Ohio, Illinois, Indiana and Wisconsin—make up that region, but they are not the top five in consumption in the nation. Pennsylvania (in the Middle Atlantic region) exceeds Illinois, Indiana and Wisconsin.

The second largest consumer of carbon steel mill shapes and castings is the Middle Atlantic region comprised of Pennsylvania, New York and New Jersey. That region's percentage is 21.79.

Regional Differences—The regions show their individuality through the types of steel they use. In the top-ranking East North Central region, sheet and strip (not including galvanized) are the No. 1 product. They comprise 47 per cent of the carbon steel used there. Likewise, in the Middle Atlantic and New England regions, sheet and strip top the list, although they account for only 31 per cent in each of those areas.

In the West North Central region,

This is the first of four articles on the geographic location of consumers of metal. It deals with carbon steel mill shapes and castings. The next three articles will cover alloy and stainless steel, copper and copper-base alloys and aluminum. For reprints of these articles write to Editorial Department, STEEL, Penton Bldg., Cleveland 13, O.

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*Patent No. 2,445,038. Other patents pending.

UNION METAL

Material Handling Equipment

bars and bar shapes lead the list of carbon steel mill shapes, although they are followed closely by sheet and strip. There, bars and bar shapes comprise 27 per cent, sheet and strip, 26 per cent.

The leading carbon steel category in South Atlantic consumption is tin plate, terne plate and black plate. It accounts for 31 per cent of that region's consumption. That category is also tops in the Pacific region, the percentage there being 34.

Plates head the consumption list in the East South Central and West South Central regions. In the East South Central states, 24 per cent of the carbon steel consumption is in plates; in the West South Central region, it's 32 per cent.

No carbon steel product breakdown is given for the Mountain states, where usage is small.

Tops for Castings — Top regional consumer of carbon steel castings was the East North Central group. It consumed 51 per cent of the national total. However, Pennsylvania, which is in the Middle Atlantic region, was the leading state in usage of carbon steel castings. It consumed 22 per cent of the national total.

Of the report's ten product groups of carbon steel, all but one found its greatest market in the East North Central region. The lone exception is heavy structural shapes and piling. The leading consumer of it is the Middle Atlantic region, with East North Central ranking second.

Sheets, Strip . . .

Sheet & Strip Prices. Pages 118 & 130

The chief strength in the steel market continues in the light, flat-rolled products. Mills are booked far ahead, except on hot-rolled, and though some slight slackening in orders is showing up, pressure for deliveries is unabated.

Virtually all makers are booked solidly through the first quarter. Some of them are accepting business for April-May shipment. A sheetmaker in the Chicago area was unable to take all the business offered for second quarter in cold-rolled, galvanized and enameling sheets.

Of an approximate 40 per cent increase in bookings in the New England area by one Pittsburgh district producer, 25 per cent has been in flat-rolled items, 10 per cent in hot-rolled bars. The period covered ranges from July, 1954, to Jan. 15, 1955.

Despite extended deliveries in cold-rolled and galvanized sheets, eastern consumers seem less disposed toward protective covering. Apparently, their stocks are in better

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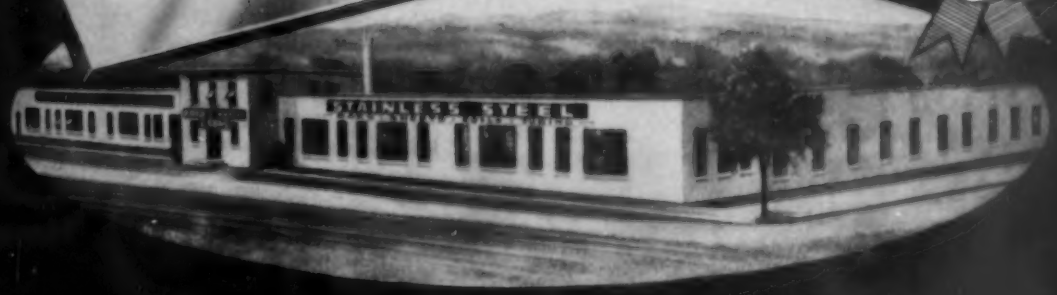

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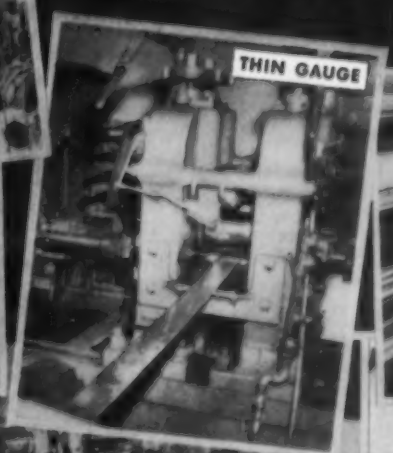

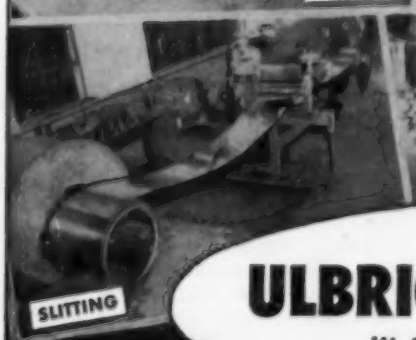

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balance. Buying, however, continues brisk in cold-rolled and some improvement in hot-rolled is noted. Specialties are moving well. Manufacturers of office furniture, cabinets, shelving and door bucks are ordering cold-rolled, and there is a smattering of demand from radio and television builders and fabricators of radiator hoods. Automotive requirements, of course, bulk most prominently in the demand picture.

On the more extended delivery items, galvanized in particular, trading has leveled off to some extent since consumers are hesitant to place orders too far ahead, and sellers are reluctant to commit themselves far into the future. Some mills are virtually booked full through the first half on continuous hot-dipped galvanized sheets. In lesser degree this situation applies to cold-rolled sheets, though deliveries are less extended, April being about average.

Tightness prevails in enameling stock, also electrical sheets. This emphasizes the growing needs of manufacturers of household appliances. Automotive requirements are thought likely to begin slackening before midyear, and this will relieve some of the pressure on the market, especially in cold-rolled sheets.

A new type aluminum-coated steel has been developed by Armco Steel Corp., Middletown, O. Known as aluminized-steel type-2, the product is made by applying molten aluminum to cold-rolled sheet steel by a patented continuous pretreatment and immersion process.

Additional cold-rolled sheet capacity is scheduled to come in Jan. 26 when Newport Steel Corp., Newport, Ky., starts its new reversing cold-reduction mill.

Experimental runs on the new mill are reported proving satisfactory performance. It is equipped to reduce hot-rolled pickled coils to desired gage in widths up to 48 in. for shearing and further processing into cold-rolled sheets.

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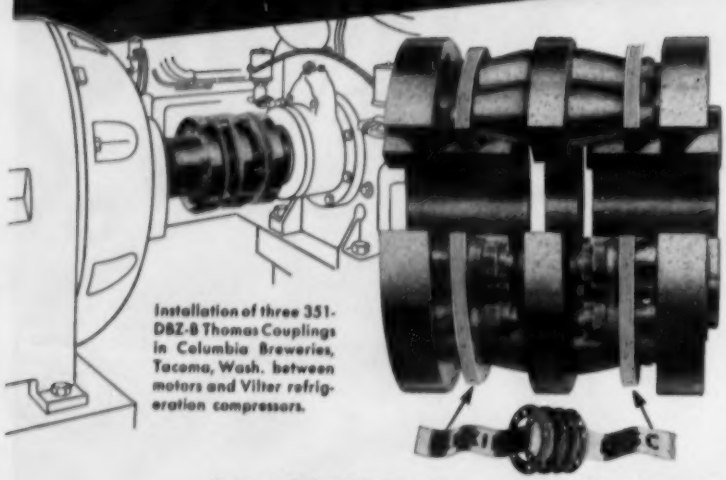

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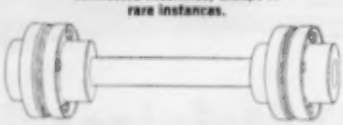

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Plates . . .

Plate Prices, Page 118

Although plate demand is reported a shade better than it has been for some time, you'll have no trouble getting prompt tonnage with the mills quoting delivery in two to three weeks. In a few cases, delivery is under two weeks. Shipments are a little firmer than they were, but it is apparent they still are easy from the standpoint of the buyer.

In the Pittsburgh district railroad requirements are beginning to climb, though over-all demand remains slow.

Clad plate deliveries are down to six weeks for stainless and six to eight weeks on other clads in New England.

A mild pickup in plate sales is noted in the Chicago market, the improvement stemming partly from a larger volume of freight car repairs now that car loadings are rising.

Industrial construction is sluggish, but it is expected to grow quickly in the second quarter. Expansion programs announced by steelmakers top investments planned in the Pittsburgh area for 1955.

Tool Steel . . .

Tool Steel Prices, Page 123

Shipments of high speed and tool steel (excluding hollow drill steel) in November totaled 7158 net tons, reports the American Iron & Steel Institute. This was an increase over the 6587 tons moved in October, but was down from the 8263-ton figure in November, 1953.

Total tonnage shipped in the first 11 months of 1954 was reported at 76,679 net tons, compared with 108,083 in the like period of the preceding year.

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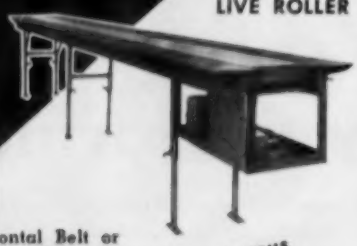

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1954 Is Eighth Best Steel Year

Output falls 23,304,140 tons under that of preceding year but production index was 5.4 per cent above the 1947-1949 average. Ingot operations average 71 per cent

MORE STEEL was produced last December than in any month since November, 1953, reports the American Iron & Steel Institute.

The month's output (8,281,000 net tons) brought total production of ingots and steel for castings for all of 1954 to 88,305,579 net tons, making the year the eighth largest in the history of the industry. Production in 1953 totaled 111,609,719 tons, or 23,304,140 tons more than were produced in 1954.

In December, the index of production rose to 116.4, comparing with 117.5 in November. The rate of operation for the closing month of the year was 78.6 per cent against 79.1 the month preceding.

The year's production index at 105.4 was 5.4 per cent better than the average for the base years 1947-49.

December output raised the total for the fourth quarter to 24,071,960 net tons. It was the best quarter in 1954. The index of production for the period was 114, and the industry operated at 76.8 per cent of capacity.

Throughout 1954, the industry's furnaces were operated at an average of 71 per cent of capacity. At the beginning of 1954 the nation's steel capacity was rated at 124,330,410 net tons, but 1955 opens with capacity rated at 125,828,310 tons, an increase of 1,497,900 tons.

Tubular Goods . . .

Tubular Goods Prices, Page 122

Merchant pipe sales are off, largely reflecting the seasonal lag in construction.

In the East, while winter has been unusually mild so far, many district builders won't gamble on the weather. So pipe and other building steel requirements are slowing up. Resellers in the area are cutting prices up to 15 per cent off, a situation, however, which prevailed under more active market conditions.

Shipments of buttweld and seamless pipe are heavier in New England. The same is true of mechanical tubing. It appears distributors and prefabricating pipe shops are filling gaps in stocks. Most warehouses and consumers are not buying up to former allocation levels, and secondary prices are inclined to be soft. Buttweld in smaller sizes continues available from mill stocks, but seamless deliveries, in most diameters, are slightly more extended.

A two-fold program to increase production of oil country tubular products is planned by National Tube Division, U. S. Steel Corp. National plans to start work at once on facilities designed to triple its output of deep-well casing at its National Works, McKeesport, Pa. At the same time work will be started at the Lorain, O. works on the addition of new upsetting units to increase production of external upset API tubing in the 2⅜ to 4½-in. OD range.

Steel Bars . . .

Bar Prices, Page 118

While steel bars continue in relatively easy supply, demand in the various categories is picking up moderately. Business is noticeably improved over a month ago and deliveries are a little more extended on a broader range of sizes.

Hot carbon bar buying is not brisk at Philadelphia, but it is better than it was only a few weeks ago.

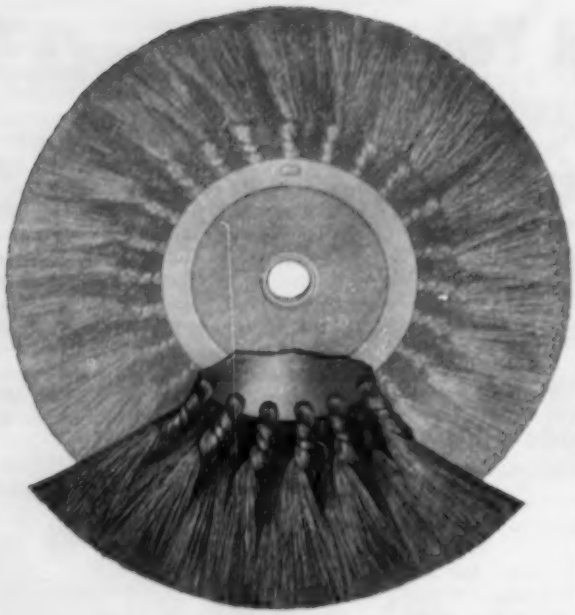
In New England, February orders are being booked for both hot-rolled and cold-drawn bars. Most users

Period	OPEN HEARTH Net tons	OPEN HEARTH Per cent of capacity	OPEN HEARTH ‡Index	BESSEMER Net tons	BESSEMER Per cent of capacity	BESSEMER ‡Index	ELECTRIC Net tons	ELECTRIC Per cent of capacity	ELECTRIC ‡Index	TOTAL Net tons	TOTAL Per cent of capacity	TOTAL ‡Index	Calculated weekly production (Net tons)	Number of weeks in month
1954														
January	7,256,526	78.3	113.3	280,453	64.0	74.1	434,507	48.9	121.7	7,951,486	75.3	111.8	1,794,916	4.43
February	6,533,213	77.9	112.8	174,253	47.4	54.9	385,771	48.1	119.6	7,093,237	74.3	110.2	1,770,809	4.00
March	6,649,667	71.7	103.8	207,726	51.1	59.1	432,207	45.7	121.0	7,289,600	69.0	102.5	1,645,506	4.43
1st Qtr.	20,429,406	75.9	109.9	642,432	54.4	63.0	1,252,485	48.6	120.8	22,334,323	72.8	108.1	1,735,950	12.86
April	6,355,326	70.9	102.7	162,657	41.3	47.8	442,954	51.5	128.2	6,970,937	68.1	101.3	1,624,927	4.29
May	6,817,961	73.6	106.4	198,063	48.7	56.4	456,724	51.4	127.9	7,472,728	70.7	105.0	1,686,848	4.43
June	6,702,006	74.7	108.1	207,666	52.7	61.1	453,962	52.8	131.3	7,363,634	72.0	107.0	1,716,485	4.29
2nd Qtr.	19,885,293	73.1	105.8	568,386	47.6	55.1	1,353,640	51.9	129.1	21,807,309	70.3	104.4	1,676,196	13.01
1st Half	40,314,699	74.5	107.8	1,210,818	51.0	59.0	2,606,125	50.3	125.0	44,131,632	71.5	106.2	1,706,900	25.87
July	6,040,120	65.3	94.3	205,313	50.6	58.4	382,164	43.1	107.0	6,627,597	62.9	93.2	1,499,456	4.43
Aug.	6,021,496	65.0	94.0	217,827	53.6	62.0	427,574	48.2	119.7	6,666,907	63.1	93.7	1,504,945	4.43
Sept.	6,149,266	68.6	99.1	214,065	54.5	63.0	453,152	52.8	131.1	6,807,483	66.7	98.9	1,590,533	4.28
3rd Qtr.	18,201,882	66.3	95.8	637,215	52.9	61.1	1,262,890	48.0	119.1	20,101,987	64.2	95.2	1,530,997	13.13
9 Mo.	58,516,571	71.7	103.7	1,848,033	51.6	59.7	3,869,015	49.5	123.0	64,233,619	69.1	102.5	1,647,016	39.00
Oct.	6,973,568	75.2	108.9	237,754	58.5	67.7	490,211	55.2	137.3	7,701,533	72.9	108.3	1,738,496	4.43
*Nov.	7,307,151	81.4	117.9	231,191	58.7	68.0	551,085	64.1	159.4	8,089,427	79.1	117.5	1,885,647	4.29
†Dec.	7,530,090	81.4	117.6	231,000	56.9	65.7	520,000	58.7	145.6	8,281,000	78.6	116.4	1,874,000	4.43
†4th Qtr.	21,810,719	79.3	114.6	699,945	58.0	67.1	1,561,296	59.3	147.5	24,071,960	76.8	114.0	1,831,960	13.14
†2nd Half	40,012,601	72.8	105.2	1,337,160	55.4	64.0	2,824,186	53.6	133.2	44,173,947	70.5	104.6	1,681,528	26.27
†Total	80,327,290	73.6	104.5	2,547,978	53.2	61.6	5,430,311	52.0	129.1	88,305,579	71.0	105.4	1,693,624	52.14
1953														
January	8,841,879	101.4	138.0	350,200	88.9	99.7	706,083	81.2	197.7	9,897,962	99.1	139.1	2,234,308	4.43
February	7,939,299	100.8	137.2	329,386	92.6	103.8	684,091	84.6	206.9	8,932,779	99.1	139.0	2,233,196	4.00
March	9,050,773	103.7	141.3	354,710	90.0	101.0	762,615	87.7	213.5	10,168,098	101.8	142.9	2,296,282	4.43
1st Qtr.	25,831,751	102.0	138.9	1,034,296	90.4	101.4	2,152,789	84.6	205.7	28,998,839	100.0	140.4	2,254,964	12.86
April	8,493,909	100.5	137.0	334,605	87.7	98.4	717,034	85.2	207.4	9,545,538	98.7	138.7	2,225,067	4.29
May	8,925,163	102.3	139.3	354,577	90.0	100.9	717,340	82.5	200.8	9,997,080	100.1	140.5	2,256,677	4.43
June	8,394,802	99.4	135.4	332,060	87.0	97.7	677,917	80.5	196.1	9,404,479	97.2	136.6	2,192,186	4.29
2nd Qtr.	25,813,574	100.8	137.2	1,021,242	88.3	99.0	2,112,291	82.7	201.5	28,947,097	98.7	138.6	2,224,988	13.01
1st Half	51,645,325	101.4	138.1	2,055,541	89.3	100.2	4,265,070	83.6	203.6	57,945,936	99.4	139.5	2,239,889	25.87
July	8,316,342	96.5	129.8	324,008	82.4	92.2	635,263	73.2	177.9	9,275,673	93.1	130.4	2,098,569	4.43
Aug.	8,453,158	97.0	132.1	310,074	78.7	88.3	632,351	72.7	177.0	9,405,580	94.2	132.2	2,123,156	4.43
Sept.	8,076,277	96.8	130.3	287,636	75.6	84.6	519,513	61.9	150.3	8,883,426	92.1	129.0	2,075,567	4.28
3rd Qtr.	24,855,774	96.1	130.8	921,780	78.9	88.4	1,787,127	69.4	168.6	27,564,681	93.1	130.6	2,099,366	13.13
9 Mos.	76,501,099	99.6	135.6	2,977,321	85.8	96.2	6,032,197	78.8	191.8	85,510,617	97.3	136.5	2,192,580	39.00
Oct.	8,848,428	99.1	135.0	325,250	82.6	92.6	489,044	56.3	136.9	9,462,722	94.7	133.0	2,136,056	4.43
Nov.	8,902,349	94.7	129.1	283,321	74.3	83.3	404,382	48.0	117.0	8,590,052	89.9	126.2	2,025,653	4.29
Dec.	7,321,947	84.1	114.3	269,813	68.6	76.8	354,568	40.9	99.3	7,946,328	79.7	111.7	1,797,812	4.43
4th Qtr.	23,972,724	92.6	126.1	878,384	75.2	84.2	1,247,994	48.4	117.7	26,099,102	88.1	123.6	1,986,233	13.14
2nd Half	48,828,498	94.4	128.4	1,800,164	77.1	86.3	3,035,121	58.9	143.2	53,663,783	90.6	127.1	2,042,778	26.27
Total	100,473,823	97.9	133.2	3,855,705	83.2	93.2	7,280,191	71.1	173.1	111,609,719	94.9	133.2	2,140,578	52.14

Note—The percentages of capacity operated are calculated on weekly capacities in 1954 of 2,092,342 net tons open hearth, 91,810 net tons bessemer and 200,397 net tons electric ingots and steel for castings, total 2,384,949 net tons; based on annual capacities as of Jan. 1, 1954 as follows: Open hearth 109,094,730 net tons, bessemer 4,787,000 net tons, electric 10,448,680 net tons, total 124,330,410 net tons.

Note—The percentages of capacity operated are calculated on weekly capacities in 1953 of 1,969,275 net tons open hearth, 88,934 net tons bessemer and 196,250 net tons electric ingots and steel for castings, total 2,254,459 net tons; based on annual capacities as of Jan. 1, 1953 as follows: Open hearth 102,677,980 net tons, bessemer 4,637,000 net tons, electric 10,232,490 net tons, total 117,547,470 net tons.

*Revised. †Preliminary figures, subject to revision. ‡Index of production based on average weekly production of the three years 1947-1948-1949.



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What's more, the special type of wire used in these knots is the fastest cutting, with the longest life, that can be produced. Built for the toughest applications, "Lightning" brushes are perfect for cleaning welds, removing scale or rubber, or cleaning parts where penetration brushing is needed.

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By Albert Portevin

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are not going beyond that month.

Demand from bolt and nut makers and converters is moderately good at New York, though elsewhere demand from them in general is only average. Diversified requirements appear a shade heavier, reflecting pickup in demand from warehouses, especially those turning to domestic mills. The price gap between domestic and imported bars is narrowed, and foreign deliveries are increasingly extended.

Midwestern demand is moderately better. Business appears coming from general consuming areas. Mills are far from solidly booked on hot-rolled, however. The market is highly competitive, with mills and customers keeping a close eye on rolling cycles.

Wire . . .

Wire Prices, Pages 120 & 121

Wire product demand appears to be somewhat mixed. At some marketing points buying is on a broader base with bookings noticeably improved. At others, seasonal slack continues in evidence, notably in the merchant items.

First quarter bookings in the East are reported heavier than for any 3-month period in more than a year. More consumers are placing orders on a 30-day and beyond basis, but by increasing operations mills are generally meeting delivery promises.

Producers of automotive products are booked well into this quarter, and demand for manufacturers wire, heading and spring grades also is higher. Backlogs are heaviest in wire for highway construction, such as railing strand, welded mesh and miscellaneous galvanized items.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 118

Moderate weather in many parts of the country has encouraged more building activity this winter than usual. This is being reflected in continued steady demand for reinforcing steel. Prices, however, continue soft.

In New England easy prices rather than lack of tonnage marks the concrete-bar market. Fabricating shops there are busy and are currently estimating actively with bridge requirements predominating. Massachusetts turnpike contracts now out for bids include about 5000 tons. Steel piling inquiry is up.

Pacific Northwest bar mills are operating steadily with road projects accounting for considerable reinforcing tonnage on books. More highway work is up for early action in Washington and Oregon.

Ores

Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit deld. E. Pa.

Foundry and basic 52-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%	20.00
N. African hematite (spot)	nom. 20.00-22.00
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, before duty

Foreign, Wolframite, good commercial quality	$25.00-$26.00
Domestic scheelite, mine	63.00

Manganese Ore

Mn 48%, nearby, 90c-92c per long ton unit c.i.f. U. S. ports, duty for buyer's account: 46-47%, 80c.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48%	2.8:1	nom. $40.00-$42.00
48%	3:1	42.00-44.00
48%	no ratio	32.00-34.00

South African Transvaal

44%	no ratio	$19.00-$20.00
48%	no ratio	31.00-32.00

Domestic

(Rail nearest seller)

18%	3:1	$39.00

Molybdenum

Sulphide concentrate, per lb, Mo content mines unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

50-60%	$3.35-$3.85
60-65%	4.00-4.35

Vanadium Ore

Cents per lb V_2O_5 content, deld. mills

Domestic	$1.00

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Pueblo, Colo., $94; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Farral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $114; Salina, Pa., $119; Niles, O., $125; Los Angeles, Pittsburg, Calif., $137.20.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $120; Warren, Niles, O., Hays, Pa., $125; Morrisville, Pa., $123.50; E. Chicago, Ind., Joliet, Rockdale, Ill., $130; Cutler, Utah, $121.55; Los Angeles, $127.85.

Super Duty: Hays, Sproul, Pa., Warren, Windham, O., Athens, Tex., $137; Morrisville, Pa., Niles, O., $140; Joliet, Ill., $143.

Semisilica Brick (per 1000)

Clearfield, Pa., $130.

Insulating Fire Brick (per 1000)

2300° *F:* Massillon, O. $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Kellenopile, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick (per 1000)

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Mo., $77.50; Wellsville, O., $81.50; Clearfield, Pa., Portsmouth, O., $87; Perla, Ark., $109; Los Angeles $110.25; Pittsburg, Calif., $111.30.

High-Alumina Brick (per 1000)

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $181; Danville, Ill., $189.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo. Clearfield, Pa., $225; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo. $260; Danville, Ill., $258; Clearfield, Pa. $267.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $147; Clearfield, Pa., $146.50; St. Louis, $159.30; Athens, Tex., $155.

Nozzles (per 1000)

Reesdale, Pa., $234.70; Johnstown, Pa., $240.70; Clearfield, Pa., $241.40; St. Louis, $259.45; Athens, Tex., $247.70; Bridgeburg, Pa., $267.50.

Runners (per 1000)

Reesdale, Pa., Johnstown, Bridgeburg, Pa., $183.50; Clearfield, Pa., $185.50; St. Louis, $195.80; Athens, Tex., $191.50.

Dolomite (per net ton)

Domestic dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettaville, Millereville, Martin, Nario, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $15.10; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite (per net ton)

Domestic, dead-burned bulk, ¼-in. grains with fines: Luning, Nev., Chewelah, Wash., $38.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$13.50-$14.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearny, N. J., ovens	$24.00
Everett, Mass., ovens New England, deld.	*26.05
Chicago, ovens	24.50
Chicago, deld.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Buffalo, ovens	25.00
Buffalo, deld.	26.25
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	23.00
Swedeland, Pa. ovens	23.00
St. Louis, ovens	
St. Louis, deld.	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, O., deld.	26.62
Detroit ovens	25.50
Detroit, deld	26.50
Pontiac, deld.	27.06
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzol	40.00
Toluol, one deg	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia	$42-$45
Birmingham area	42.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $35-$36; 70%, $32-$33; 60%, $28-$29. Imported, net tons, duty paid, metallurgical grade: European, $28-$30; Mexican, $25.50.

Electrodes

(Threaded with nipple, unboxed f.o.b. plant)

Diam	Length	Per 100 lb
GRAPHITE		
Inches		
2	24	$43.50
2½	30	28.00
3	40	27.25
4	40	26.00
5¼	40	25.75
6	60	23.25
7, 8, 9, 10	60	21.00
12, 14	72	20.50
16	72	20.00
17	60	20.50
18, 20	72	20.00
CARBON		
40	100	$8.95
40, 35, 30	110	8.95
30	84	9.10
24	96	8.90
24	72, 84	9.10
20	90	8.95
20	84	9.10
17	72	9.10
17	60	9.50
14	72	9.50
14, 12, 10	60	10.30
8	60	10.55

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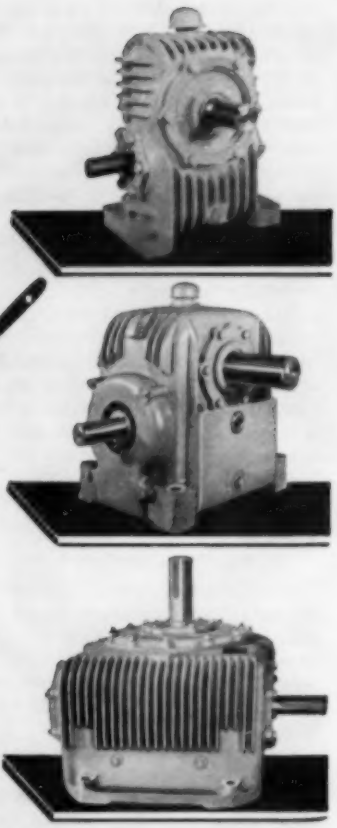

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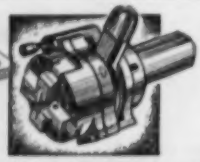

famous for accuracy and straightness of threads, low chaser costs, less downtime, more pieces per day.

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Scrap . . .

Scrap Prices, Page 136

Philadelphia — Prices on medium grades of scrap are higher, reflecting improved interest by domestic consumers in addition to a steady demand from abroad. No. 1 heavy melting and No. 1 bundles are holding at $33, delivered; No. 2 heavy melting at $30.50-$31; and No. 1 busheling at $31.50.

New York—The scrap market is active, with brisk demand from domestic and foreign consumers. Brokers' buying prices on the major grades of steel and cast material are unchanged, however, indicating reasonably good supplies.

Among the specialties, prices for 18-8 stainless borings and turnings are higher at $80-$85, for type 410 sheets, clips and solids, $45-$50.

Pittsburgh—As the first of several railroad lists closed last week, No. 1 railroad heavy melting increased $2 a ton to $38-$39. Rails and railroad specialties increased similarly. There's possibility of further change as other lists close.

Buffalo—Higher prices and stronger tendencies in the scrap market only seem to baffle local dealers as bidding continues within current price ranges.

Detroit—The scrap market is in the doldrums at mid-month. Little activity has been noted since the automobile lists closed.

Cincinnati—Lack of transactions has created softness in the local scrap market. The only price change was in the form of a correction for low phosphorus from $37-$38 to $35-$36.

Cleveland—Sentiment is improved in the scrap market here, though there hasn't been any substantial new buying since about the opening of the month. But prices on the top grades of steel scrap are up slightly, largely reflecting bullishness at Pittsburgh. A substantial volume of scrap is moving to the steel plants, but it is said to be largely production material from automotive and other manufacturing plants.

Seattle—Although buying is under normal levels, the scrap market is firm. Buyers report ample offerings. No. 1 and No. 2 heavy melting steel are unchanged at $27 and $23, respectively.

Washington—Scrap iron and steel licensed for export from continental U. S. in December totaled 291,852 short tons, only slightly more than half the 523,058 tons licensed in November, reports the Bureau of Foreign Commerce. The decline followed adoption of new procedures designed to keep a closer check on scrap exports. Total licensing for the fourth quarter of last year amounted to 1,157,281 short tons.

Washington—Consumption of ferrous scrap in November totaled 4,932,000 gross tons, increasing for the fourth consecutive month, reports the Bureau of Mines.

The total melt (9,695,000 gross tons) consisted of 50.9 per cent scrap and 49.1 per cent pig iron. This compares with 51.4 and 48.6, respectively, during October.

Stocks of ferrous scrap held by consumers totaled 6,112,000 tons, an increase of 5 per cent over October's. The 2,258,000 tons of pig iron held by consumers and suppliers decreased 4 per cent.

Pig Iron . . .

Pig Iron Prices, Page 133

Demand for pig iron continues to increase, stimulating blast furnace activity. United States Steel Corp. put its No. 2 blast furnace at Carrie Furnaces, Rankin, Pa., back into operation on Jan. 7, following a complete relining. With a capacity of 990 tons a day, it had been out since Feb. 2, 1954.

Shenango Furnace Co., Sharpsville, Pa., has blown in its No. 3 blast furnace. It had been idle over a year. The firm's subsidiary, Shenango-Penn Mold Co., has put on a third shift at its ingot mold foundry.

Youngstown Sheet & Tube Co. is relining its blast furnace at Hubbard Works, Hubbard, O.

A substantial portion of current demand is for inventory replenishment. In the East, gray iron foundries are averaging less than four days a week. The cast iron pipe foundry in Everett, Mass., is operating well above average for New England shops, reflecting a seasonal upturn in demand for pipe.

(*Please turn to page* 138)

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Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Jan. 12	$35.00
Jan. 5	34.50
Dec. Avg.	32.58
Jan. 1954	29.05
Jan. 1950	26.93

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting...	36.00-37.00
No. 2 heavy melting...	33.00-34.00
No. 1 bundles	36.00-37.00
No. 2 bundles	28.00-29.00
No. 1 busheling	36.00-37.00
Machine shop turnings	18.00-19.00
Mixed borings, turnings	18.00-19.00
Short shovel turnings.	22.00-23.00
Cast iron borings	22.00-23.00
Cut structurals, 5 ft lengths	37.00-38.00
Heavy turnings	*31.00-32.00*
Punchings & plate scrap	38.00-39.00
Electric furnace bundles	38.00-39.00

Cast Iron Grades

No. 1 cupola	36.00-37.00
Charging box cast	31.00-32.00
Heavy breakable cast	*31.00-32.00*
Unstripped motor blocks	22.00-23.00
No. 1 machinery cast	*42.00-43.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*38.00-39.00*
Rails, 2-ft and under	*47.00-48.00*
Rails, 18-in. and under	*48.00-49.00*
Rails, random lengths	*42.00-43.00*
Railroad specialties	*40.00-41.00*

Stainless Steel Scrap

18-8 bundles & solids.	185.00-195.00
18-8 turnings	90.00-95.00
430 bundles & solids..	85.00-90.00
430 turnings	60.00-62.00

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting	*33.00-34.00*
No. 2 heavy melting	*29.00-30.00*
No. 1 bundles	*33.00-34.00*
No. 2 bundles	*26.00-27.00*
No. 1 busheling	*33.00-34.00*
Machine shop turnings.	16.00-17.00
Mixed borings, turnings	20.00-21.00
Short shovel turnings ..	20.00-21.00
Cast iron borings	20.00-21.00
Low phos.	*33.00-34.00*
Cut structural plate 2 ft and under	38.00-39.00
Alloy free, short shovel turnings	23.00-24.00
Electric furnace bundles	33.00-34.00

Cast Iron Grades

No. 1 cupola	44.00-45.00
Charging box cast	33.00-34.00
Stove plate	38.00-39.00
Heavy breakable cast..	30.00-31.00
Unstripped motor blocks	*28.00-29.00*
Brake shoes	*30.00-31.00*
Clean auto cast	*43.00-44.00*
No. 1 wheels	37.00-38.00
Burnt cast	29.00-30.00
Drop broken machinery	44.00-45.00

Railroad Scrap

No. 1 R.R. heavy melt.	35.00-36.00
R.R. malleable	44.00-45.00
Rails, 2-ft and under	*48.00-49.00*
Rails, 18-in. and under	*49.00-50.00*
Rails, random lengths.	43.00-44.00
Cast steel	36.00-37.00
Railroad specialties	*37.00-38.00*
Uncut tires	37.00-38.00
Angles, splice bars	42.00-43.00
Rails, rerolling	52.00-53.00

Stainless Steel (Brokers' Buying Prices)

18-8 bundles, solids	190.00-200.00
18-8 turnings	80.00-90.00
430 clips, bundles, solids	80.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting	*36.00-37.00*
No. 2 heavy melting	*32.00-33.00*
No. 1 bundles	*36.00-37.00*
No. 2 bundles	*27.50-28.50*
No. 1 busheling	*36.00-37.00*
Machine shop turnings	14.00-15.00
Short shovel turnings..	22.00-23.00
Cast iron borings	22.00-23.00
Low phos.	36.00-37.00
Electric furnace bundles	*36.00-37.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*36.00-37.00*

CHICAGO

No. 1 heavy melting...	34.00-35.00
No. 2 heavy melting...	32.00-33.00
No. 1 factory bundles..	36.00-37.00
No. 1 dealer bundles...	33.00-34.00
No. 2 bundles	24.00-25.00
No. 1 busheling	34.00-35.00
Machine shop turnings.	17.00-18.00
Mixed borings, turnings	19.00-20.00
Short shovel turnings..	19.00-20.00
Cast iron borings	19.00-20.00
Cut structurals, 3 ft...	36.00-37.00
Punchings & plate scrap	37.00-38.00
Electric furnace bundles	36.00-37.00

Cast Iron Grades

No. 1 cupola	39.00-41.00
Stove plate	34.00-35.00
Unstripped motor blocks	26.00-27.00
Clean auto cast	44.00-45.00
Drop broken machinery	44.00-45.00

Railroad Scrap

No. 1 R.R. heavy melt.	38.00-39.00
R.R. malleable	44.00-45.00
Rails, 2-ft and under	50.00-51.00
Rails, 18-in. and under	51.00-52.00
Angles, splice bars	43.00-44.00
Rails, rerolling	52.00-54.00

Stainless Steel Scrap

18-8 bundles & solids.	190.00-195.00
18-8 turnings	*95.00-100.00*
430 bundles & solids	*75.00-80.00*
430 turnings	*40.00-45.00*

Chicago Mercantile Exchange

(Week ended Jan. 12)

No. 1 Heavy Melting

	High	Low	Close
Jan.	35.25b	35.125	35.25*
Mar.			36.50*

No. 2 Heavy Melting

Feb.			33.125*

Sales (40-ton Units): 1 January.
*Nominal. b—Bid.

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting...	27.00
No. 2 heavy melting...	19.00
No. 1 bundles	27.00
No. 2 bundles	18.00
No. 1 busheling	26.00
Machine shop turnings	11.00
Mixed borings, turnings	11.00
Short shovel turnings..	15.00
Punchings & plate scrap	29.00

Cast Iron Grades

Charging box cast	27.00
No. 1 cupola	34.00
Stove plate	30.00
Heavy breakable	25.00
Unstripped motor blocks	20.00
Clean auto cast	35.00
Malleable	30.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting..	31.00-32.00
No. 2 heavy melting..	25.00-26.00
No. 1 bundles	31.00-32.00
No. 2 bundles	20.00-21.00
No. 1 busheling	31.00-32.00
Machine shop turnings.	13.00-14.00
Mixed borings, turnings	17.00-18.00
Short shovel turnings..	17.00-18.00
Cast iron borings	17.00-18.00
Low phos. 18-in.	*35.00-36.00*

Cast Iron Grades

No. 1 cupola	39.00
Heavy breakable cast..	35.00
Charging box cast	36.00
Drop broken machinery	45.00

Railroad Scrap

No. 1 R.R. heavy melt.	33.00-34.00
Rails, 18-in. and under	46.00-47.00
Rails, random lengths.	38.00-39.00

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting	*33.50*
No. 2 heavy melting	*30.50-31.00*
No. 1 bundles	*33.50*
No. 2 bundles	26.50-27.00
No. 1 busheling	*31.50*
Electric furnace bundles	*34.00*
Machine shop turnings	*19.00*
Mixed borings, turnings	*19.50*
Short shovel turnings..	21.00
Structurals & plate	*35.00*
Heavy turnings	29.50-30.00
Couplers, springs, wheels	35.00
Rail crops, 2 ft & under	48.00

Cast Iron Grades

No. 1 cupola	35.00
Malleable	41.50-43.00
Heavy breakable cast	*37.00*
Drop broken machinery	42.00-43.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting...	27.00-28.00
No. 2 heavy melting...	25.00-26.00
No. 1 bundles	27.00-28.00
No. 2 bundles	20.00-21.00
Machine shop turnings	10.00-10.50
Mixed borings, short turnings	11.00-12.00
Low phos. (structural & plate)	30.00-31.00
Short shovel turnings..	12.00-13.00

Cast Iron Grades

No. 1 cupola	29.00-30.00
Unstripped motor blocks	22.00-23.00

Stainless Steel

18-8 sheets, clips, solids	175.00-180.00
18-8 borings, turnings	*80.00-85.00*
430 sheets, clips, solids	55.00-60.00
410 sheets, clips, solids	*45.00-50.00*

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*24.00-25.00*
No. 2 heavy melting	*21.00-21.50*
No. 1 bundles	*24.50-25.00*
No. 2 bundles	16.25-17.00
Mixed borings, turnings	9.50-10.00
Machine shop turnings.	6.00-8.50
Short shovel turnings.	10.50-11.00
No. 1 cast	29.00-30.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast..	32.00-33.00

BUFFALO

No. 1 heavy melting...	30.00-31.00
No. 2 heavy melting	*25.50-26.00*
No. 1 bundles	30.00-31.00
No. 2 bundles	*23.50-24.50*
No. 1 busheling	30.00-31.00
Machine shop turnings.	18.00-19.00
Mixed boring, turnings.	20.00-21.00
Short shovel turnings ..	21.00-22.00
Cast iron borings	20.00-21.00
Low phos.	*33.50-34.50*

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	38.00-39.00
No. 1 machinery	43.00-44.00

Railroad Scrap

Rails, random lengths..	35.00-36.00
Rails, 3 ft and under..	42.00-43.00
Railroad specialties	36.50-37.50

BIRMINGHAM

No. 1 heavy melting...	26.00-27.00
No. 2 heavy melting...	24.00-25.00
No. 1 bundles	23.00-24.00
No. 2 bundles	19.00-20.00
Cast iron borings	16.00-17.00
Short shovel turnings..	16.00-17.00
Machine shop turnings.	15.00-16.00
Electric furnace bundles	29.00-30.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	45.00-46.00
Stove plate	42.00-43.00
Bar crops and plate	33.00-34.00
Structural plate, 2 ft	33.00-34.00
Unstripped motor blocks	35.00-36.00

Railroad Scrap

No. 1 R.R. heavy melt.	32.00-33.00
Rails, 18-in. and under	40.00-41.00
Rails, rerolling	40.00-41.00
Angles, splice bars	38.00-39.00
Stand. steel axles	35.00-36.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting...	30.00
No. 2 heavy melting...	28.00
No. 1 bundles	30.00
No. 2 bundles	23.75
Machine shop turnings.	13.00
Short shovel turnings ..	15.00

Cast Iron Grades

No. 1 cupola	40.00
Charging box cast	32.50
Heavy breakable cast..	32.50
Unstripped motor blocks	32.50
Brake shoes	30.00
Clean auto cast	41.00
Stove plate	36.50

Railroad Scrap

No. 1 R.R. heavy melt.	35.50
Rails, 18-in. and under	46.00
Rails, random lengths..	43.00-44.00
Rails, rerolling	50.00
Angles, splice bars	39.00-40.00

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting..	27.00
No. 2 heavy melting..	23.00
No. 1 bundles	21.00
No. 2 bundles	17.00
No. 3 bundles	13.00
Machine shop turnings	12.00
Mixed borings, turnings	12.00
Short shovel turnings..	12.00
Electric furnace, No. 1	32.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	32.00-35.00
Heavy breakable cast..	23.00
Unstripped motor blocks	25.00
No. 1 wheels	21.00
Stove plate(f.o.b. plant)	26.00
Brake shoes	28.00

Railroad Scrap (Delivered consumer plant)

Rails, random lengths..	30.00-34.00

LOS ANGELES

No. 1 heavy melting..	20.00
No. 2 heavy melting..	14.00
No. 1 bundles	20.00
No. 2 bundles	16.00
Machine shop turnings.	5.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	42.00-44.00

SAN FRANCISCO

No. 1 heavy melting..	24.00
No. 2 heavy melting..	20.00
No. 1 bundles	23.00
No. 2 bundles	18.00
No. 1 busheling	24.00
Machine shop turnings	6.00
Mixed borings, turnings	6.00
Short shovel turnings.	9.00
Cast iron borings	9.00
Cut structurals	25.00
Heavy turnings	9.00
Punchings & plate scrap	25.00
Electric furnace bundles	19.00

Cast Iron Grades

No. 1 cupola	40.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast..	36.00
Unstripped motor blocks	30.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	48.00

HAMILTON, ONT.

(Delivered prices)

No. 1 heavy melting..	26.00
No. 2 heavy melting..	23.00
No. 1 bundles	26.00
No. 2 bundles	21.00
Mixed steel scrap	20.00
Mixed borings, turnings	12.00
Rails, remelting	35.00
Busheling, new factory: Prepared	24.00
Unprepared	20.00
Short steel turnings	12.00

Cast Iron Grades†

No. 1 machinery cast..	42.00-43.00

†F.o.b., shipping point.

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Malleable FOUNDERS' SOCIETY

1800 Union Commerce Building Cleveland 14, Ohio

(*Concluded from page 135*)

Only a small amount of imported iron is being offered in the Philadelphia area as the market is stronger on the other side.

Warehouse . . .

Warehouse Prices, Page 123

Price advances posted by mills on additional grades of stainless and alloy steels (mostly those containing molybdenum) are being followed by warehouse distributors. The average advance is close to $10 a ton.

Demand for alloys is slightly heavier and warehouse products are moving on a broader base. Requirements remain heavy for galvanized sheet, other flat-rolled products and small bars. Some small fabricators are unsure of their steel requirements for later this year, and their buying is at the average fourth-quarter, 1954 rate.

Distributors' stocks are in good balance, contrasting sharply with the situation a year ago when numerous products were in excess supply.

FERROALLOY quotations remain unchanged. The current price schedule was published in full on page 114 of the Jan. 10 issue of STEEL.

Structural Shapes . . .

Structural Shape Prices, Page 118

Seasonl influences are reflected in structural steel demand. Except for uncertainties attending public projects as new state administrations take office, prospects are promising for active building come spring.

Fabricators in the Philadelphia area are figuring on a fairly substantial amount of work though new inquiries currently are light. The lull is ascribed largely to seasonal influences. At the same time, in the New York area structural buying (largely modest tonnages) is reported fairly brisk.

New York's new governor in his first annual message said he had ordered the Public Works Department to suspend temporarily the awarding of new construction contracts because of a "serious fiscal position." Later, he said exceptions would be made, including work paid for from proceeds of bond issues. The structural trade interpreted this as applying, among other projects, to thruway spurs and connections to main highway projects of adjoining states.

Actually, the governor's original statement, while creating confusion, came as no great shock to fabricators as delays in placing contracts by

CLASSIFIED

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ASSISTANT SUPERINTENDENT
Cold Drawn Mill in East has opening for young man 23-30, graduate of college or technical school. Should have some engineering and production line experience. Replies will be held confidential. Reply Box 188, STEEL, Penton Building, Cleveland 13, Ohio.

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Penton Building, Cleveland 13, Ohio

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Reply Box 193, STEEL
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states usually follow changes in political administrations.

Firmer prices for plain imported structurals have eased foreign steel demand in New England. An eastern Pennsylvania mill lowered its prices to meet the foreign competition, booking volume on a cost basis, mostly standard shapes. New England fabricators' inventories are well balanced, with current buying held largely to fill-in needs.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

3800 tons, trash racks, lift beams, etc., The Dalles power house, to California Steel Products Co., Richmond, Calif., low at $688,603, by U. S. Engineer, Portland, Oreg.

1350 tons, five grade crossings, Mansfield, Mass., to Bethlehem Steel Co., Bethlehem, Pa., through Westcott Construction Co., North Attleboro, Mass., general contractor.

1160 tons, two schools, No. 19 and No. 107, Manhattan, New York, to Bethlehem Fabricators, Bethlehem, Pa.

735 tons, state bridge work, section 37-E, Luzerne county, Pa., through Lycoming Construction Co., to Anthracite Bridge Co., Scranton, Pa.

715 tons, McGrath building, Columbia University, New York, to Bethlehem Fabricators, Bethlehem, Pa.

STRUCTURAL STEEL PENDING

4150 tons, section, state turnpike, M-2u, Hudson county, New Jersey, Harris Structural Steel Co., New York, low bidder.

1700 tons, state bridges, Lake county, Indiana; bids Jan. 19, Indiana Toll Road Commission, Indianapolis; also 650 tons, reinforcing, contract C-2.

1630 tons, state bridges, Lake county, Indiana; bids Jan. 19, Indiana Toll Road Commission, Indianapolis; also 675 tons, reinforcing, contract C-1.

1440 tons, state highway bridges, composite beam spans, Greenwich-Killingly expressway, West Haven, Conn.; bids Jan. 24, Hartford, Conn.

975 tons, state bridge work, section 36-D, Lehigh county, Pa., H. J. Williams, low on general contract.

960 tons, angles, General Stores Supply Office, Navy, Philadelphia.

630 tons, state bridges, Lake county, Indiana; bids in to Indiana Toll Road Commission, Indianapolis; also 240 tons, reinforcing, contract C-11/12.

540 tons, two multipurpose hangars, Dow Air Force Base, Bangor, Me.; bids Jan. 25, Corps of Engineers, Boston.

500 tons, three-span, continuous-riveted plate girder bridge, Farmington river, East Granby-Simsbury, Conn.; bids Jan. 17, Hartford, Conn.; also 80 tons steel piling.

243 tons, state turnpike bridge, section 37-A, Carbon county, Pa., bids Feb. 1.

100 tons, warehouse building, Air Field Base, Portsmouth, N. H.; Davison Construction Co., Manchester, N. H., low, general contract.

100 tons, state highway bridge, Dennis, Mass.

100 tons, galvanized tower steel; bids in to purchasing agent, Seattle.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1200 tons, hospital center, U. S. Soldiers' Home grounds, Washington, D. C., to Ceco Steel Products Co., Washington, through Standard Construction Co., Washington, general contractor; structurals to Union Iron Works, Washington.

1700 tons, five grade crossing eliminations, Mansfield, Mass., to Truscon Steel Division, Republic Steel Corp., Boston, through Westcott Construction Co., North Attleboro, Mass., general contractor.

485 tons, seven state bridges, Greenwich-Killingly expressway, Westbrook, Conn., to Bethlehem Steel Co., Bethlehem, Pa., through L. G. DeFalco & Son, Inc., New Haven, Conn., general contractor.

345 tons, four rolled beam bridges, Greenwich-Killingly expressway, Norwalk, Conn., to Bethlehem Steel Co., Bethlehem, Pa., through Paul Bacco & Son Inc., general contractor.

262 tons, high school, Renton, Wash., to Soule Steel Co., Seattle; Lewis Construction Co., Seattle, general contractor.

250 tons, junior high school, Lowell, Mass., to Bethlehem Steel Co., Bethlehem, Pa., bars, and E. K. Carpenter Co., Lynn, Mass., structurals, through Jefferson Construction Co., Cambridge, Mass., general contractor.

175 tons, also 775 tons H-piling, multispan Cousins island bridge, Yarmouth, Me., to Bancroft & Martin Rolling Mills Co., South Portland, Me., through Ellis C. Snodgrass Inc., Portland, Me., general contractor.

100 tons, Washington state road project, to Northwest Steel Rolling Mills, Inc., Seattle; Rumsey & Co., Seattle, general contractor.

REINFORCING BARS PENDING

465 tons, three bridges, Chicopee, Mass.; bids to Massachusetts Turnpike Commission, Boston.

300 tons, or more, Oregon state highway projects, 10 reinforced concrete spans and viaducts in Curry, Douglas, Lane, Linn and Washington counties; also 405-ft and 517-ft grade separations, Multnomah county; bids to state highway commission, Portland, Oreg., Jan. 19.

255 tons, piers and abutment, Providence river; M. A. Gammino Construction Co., Providence, R. I., low, general contract.

100 tons, Montana highway projects, two bridges Big Horn county, to McClellan & MacQueen Inc., Worland, Wyo., low at $69,728.

100 tons, state highway bridge, Farmington river, East Granby-Simsbury, Conn.; bids Jan. 17, Hartford, Conn.

PLATES . . .

PLATES PENDING

1240 tons, hull, medium tensile; bids Jan. 19, General Stores Supply Office, Navy, Philadelphia; same agency closes Jan. 25 on 195 tons, floor plates.

1060 tons, armor plate; bids Jan. 24, Procurement Office, Aberdeen Proving Ground, Md.

600 tons, six fuel storage tanks, Nahnek, Alaska; bids to Alaska U. S. Engineer, Seattle, Jan. 18.

225 tons, fuel storage and 280,000-gallon water tank, Carlsbad, N. Mex.; bids to Corps of Engineers, Albuquerque, N. Mex.

200 tons, two, 30,000-barrel storage tanks, Air Force base, Altus, Okla.; bids Jan. 25, Corps of Engineers, Tulsa, Okla.

125 tons, elevated water tank, Navy auxiliary air station, Kingsville, Tex., Chicago Bridge & Iron Co., Chicago, low, $92,870.

125 tons, 1740 ft, 24 to 60-in. welded steel pipe, highway, Chicopee, Mass.; bids to Massachusetts Turnpike Commission, Boston.

PIPE . . .

CAST IRON PIPE PLACED

400 tons, 6 and 4 in. to American Cast Iron Pipe Co., Seattle, by Bellingham, Wash.

90 tons, 16 in. for Pendleton, Oreg., to Pacific States Cast Iron Pipe Co., Portland, Oreg.

CAST IRON PIPE PENDING

100 tons, various sizes; bids to Seattle, Jan. 12.

RAILS, CARS . . .

RAILROAD CARS PLACED

Atchison, Topeka & Santa Fe, 500 box cars, to ACF Industries Inc., New York.

Seaboard Air Line, 25 stainless-steel passenger cars; 19 to Pullman-Standard Car Mfg. Co., Chicago; 6 to Budd Co., Philadelphia.

RAILROAD CARS PENDING

New York, New Haven & Hartford has authorized the rebuilding of 1000 box cars.

RAILS PLACED

U. S. Engineer, Portland, Oreg., 3633 tons 130.5 and 110.4 lb to Colorado Fuel & Iron Corp., Denver, Colo.; negotiated price $453,044; for relocation of railroad at The Dalles dam project.

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PANGBORN BLASTS by don herold

When those small metal parts call out, "Hey, cleaning time!"
And you have to remove scale, old paint, rust or grime . . .

You can clean them in seconds and save money, too —
Pangborn's Blast Cleaning Cabinet's made just for you.

It produces a finish so smooth and so clean,
It will do the best job that you ever have seen.

Pangborn Blast Cleaning Cabinet

for efficient, low-cost cleaning of metal parts. Cleans pieces up to 35" x 60" in size. Models from $319 and up.

For details, write:
PANGBORN CORP., 1600 Pangborn Blvd., Hagerstown, Maryland

Pangborn

BLAST CLEANS CHEAPER
with the right equipment for every job

50th Anniversary Medallion

states usually follow changes in political administrations.

Firmer prices for plain imported structurals have eased foreign steel demand in New England. An eastern Pennsylvania mill lowered its prices to meet the foreign competition, booking volume on a cost basis, mostly standard shapes. New England fabricators' inventories are well balanced, with current buying held largely to fill-in needs.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

3800 tons, trash racks, lift beams, etc., The Dalles power house, to California Steel Products Co., Richmond, Calif., low at $688,809, by U. S. Engineer, Portland, Oreg.

1350 tons, five grade crossings, Mansfield, Mass., to Bethlehem Steel Co., Bethlehem, Pa., through Westcott Construction Co., North Attleboro, Mass., general contractor.

1100 tons, two schools, No. 19 and No. 107, Manhattan, New York, to Bethlehem Fabricators, Bethlehem, Pa.

235 tons, state bridge work, section 37-E, Luzerne county, Pa., through Lycoming Construction Co., to Anthracite Bridge Co., Scranton, Pa.

115 tons, McGrath building, Columbia University, New York, to Bethlehem Fabricators, Bethlehem, Pa.

STRUCTURAL STEEL PENDING

2100 tons, section, state turnpike, M-2u, Hudson county, New Jersey, Harris Structural Steel Co., New York, low bidder.

1700 tons, state bridges, Lake county, Indiana; bids Jan. 19, Indiana Toll Road Commission, Indianapolis; also 650 tons, reinforcing, contract C-2.

1630 tons, state bridges, Lake county, Indiana; bids Jan. 19, Indiana Toll Road Commission, Indianapolis; also 675 tons, reinforcing, contract C-1.

1440 tons, state highway bridges, composite beam spans, Greenwich-Killingly expressway, West Haven, Conn.; bids Jan. 24, Hartford, Conn.

975 tons, state bridge work, section 36-D, Lehigh county, Pa., H. J. Williams, low on general contract.

950 tons, angles, General Stores Supply Office, Navy, Philadelphia.

930 tons, state bridges, Lake county, Indiana; bids in to Indiana Toll Road Commission, Indianapolis; also 240 tons, reinforcing, contract C-11/12.

540 tons, two multipurpose hangars, Dow Air Force Base, Bangor, Me.; bids Jan. 26, Corps of Engineers, Boston.

500 tons, three-span, continuous-riveted plate girder bridge, Farmington river, East Granby-Simsbury, Conn.; bids Jan. 17, Hartford, Conn.; also 80 tons steel piling.

343 tons, state turnpike bridge, section 37-A, Carbon county, Pa., bids Feb. 1.

100 tons, warehouse building, Air Field Base, Portsmouth, N. H.; Davison Construction Co., Manchester, N. H., low, general contract.

150 tons, state highway bridge, Dennis, Mass.

100 tons, galvanized tower steel; bids in to purchasing agent, Seattle.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1200 tons, hospital center, U. S. Soldiers' Home grounds, Washington, D. C., to Ceco Steel Products Co., Washington, through Standard Construction Co., Washington, general contractor; structurals to Union Iron Works, Washington.

1700 tons, five grade crossing eliminations, Mansfield, Mass., to Truscon Steel Division, Republic Steel Corp., Boston, through Westcott Construction Co., North Attleboro, Mass., general contractor.

485 tons, seven state bridges, Greenwich-Killingly expressway, Westbrook, Conn., to Bethlehem Steel Co., Bethlehem, Pa., through L. G. DeFalco & Son, Inc., New Haven, Conn., general contractor.

345 tons, four rolled beam bridges, Greenwich-Killingly expressway, Norwalk, Conn., to Bethlehem Steel Co., Bethlehem, Pa., through Paul Bacco & Son Inc., general contractor.

263 tons, high school, Renton, Wash., to Soule Steel Co., Seattle; Lewis Construction Co., Seattle, general contractor.

250 tons, junior high school, Lowell, Mass., to Bethlehem Steel Co., Bethlehem, Pa., bars, and E. K. Carpenter Co., Lynn, Mass., structurals, through Jefferson Construction Co., Cambridge, Mass., general contractor.

175 tons, also 775 tons H-piling, multispan Cousins island bridge, Yarmouth, Me., to Bancroft & Martin Rolling Mills Co., South Portland, Me., through Ellis C. Snodgrass Inc., Portland, Me., general contractor.

100 tons, Washington state road project, to Northwest Steel Rolling Mills, Inc., Seattle; Rumsey & Co., Seattle, general contractor

REINFORCING BARS PENDING

965 tons, three bridges, Chicopee, Mass.; bids to Massachusetts Turnpike Commission, Boston.

800 tons, or more, Oregon state highway projects, 10 reinforced concrete spans and viaducts in Curry, Douglas, Lane, Linn and Washington counties; also 405-ft and 517-ft grade separations, Multnomah county; bids to state highway commission, Portland, Oreg., Jan. 19.

255 tons, piers and abutment, Providence river; M. A. Gammino Construction Co., Providence, R. I., low, general contract.

100 tons, Montana highway projects, two bridges Big Horn county, to McClellan & MacQueen Inc., Worland, Wyo., low at $69,728.

100 tons, state highway bridge, Farmington river, East Granby-Simsbury, Conn.; bids Jan. 17, Hartford, Conn.

PLATES . . .

PLATES PENDING

1240 tons, hull, medium tensile; bids Jan. 19, General Stores Supply Office, Navy, Philadelphia; same agency closes Jan. 25 on 195 tons, floor plates.

1050 tons, armor plate; bids Jan. 24, Procurement Office, Aberdeen Proving Ground, Md.

600 tons, six fuel storage tanks, Naknek, Alaska; bids to Alaska U. S. Engineer, Seattle, Jan. 18.

225 tons, fuel storage and 280,000-gallon water tank, Carlsbad, N. Mex.; bids to Corps of Engineers, Albuquerque, N. Mex.

200 tons, two, 30,000-barrel storage tanks, Air Force base, Altus, Okla.; bids Jan. 25, Corps of Engineers, Tulsa, Okla.

125 tons, elevated water tank, Navy auxiliary air station, Kingsville, Tex., Chicago Bridge & Iron Co., Chicago, low, $92,870.

125 tons, 1740 ft, 24 to 60-in. welded steel pipe, highway, Chicopee, Mass.; bids to Massachusetts Turnpike Commission, Boston.

PIPE . . .

CAST IRON PIPE PLACED

400 tons, 6 and 4 in. to American Cast Iron Pipe Co., Seattle, by Bellingham, Wash.

90 tons, 16 in. for Pendleton, Oreg., to Pacific States Cast Iron Pipe Co., Portland, Oreg.

CAST IRON PIPE PENDING

100 tons, various sizes; bids to Seattle, Jan. 12.

RAILS, CARS . . .

RAILROAD CARS PLACED

Atchison, Topeka & Santa Fe, 500 box cars, to ACF Industries Inc., New York.

Seaboard Air Line, 25 stainless-steel passenger cars; 19 to Pullman-Standard Car Mfg. Co., Chicago; 6 to Budd Co., Philadelphia.

RAILROAD CARS PENDING

New York, New Haven & Hartford has authorized the rebuilding of 1000 box cars.

RAILS PLACED

U. S. Engineer, Portland, Oreg., 3633 tons 130.8 and 110.4 lb to Colorado Fuel & Iron Corp., Denver, Colo.; negotiated price $453,044; for relocation of railroad at The Dalles dam project.

PUNCHES·DIES

RIVET SETS · COMPRESSION RIVETER DIES

Made of highest standards and uniform quality thus insuring maximum service.

Since 1903

Large inventory of stock sizes of round punches and dies—also rivet sets available for immediate shipment. Square, rectangular, oblong and elliptical shapes made to order.

Write Dept. A for New Catalog 54

GEO. F. MARCHANT COMPANY

1420-34 So. ROCKWELL STREET CHICAGO 8, ILLINOIS

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You can clean them in seconds and save money, too —
Pangborn's Blast Cleaning Cabinet's made just for you.

It produces a finish so smooth and so clean,
It will do the best job that you ever have seen.

Pangborn Blast Cleaning Cabinet

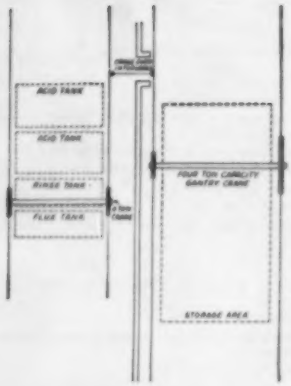
for efficient, low-cost cleaning of metal parts. Cleans pieces up to 35" x 60" in size. Models from $319 and up.

For details, write:
PANGBORN CORP., 1600 Pangborn Blvd., Hagerstown, Maryland

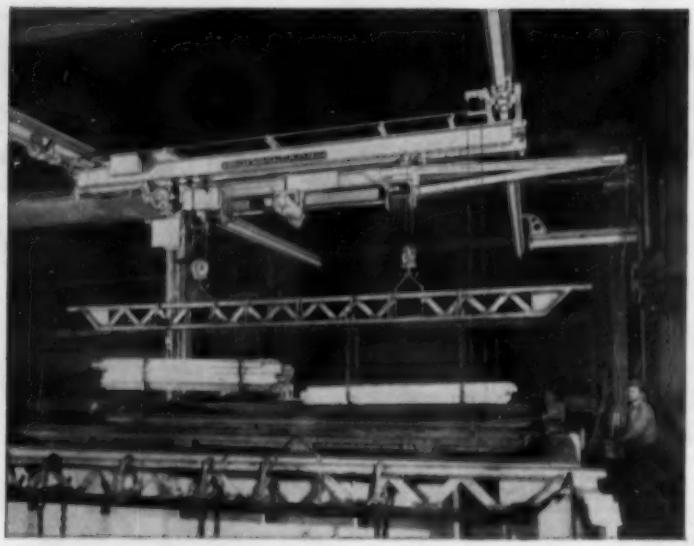
Pangborn

BLAST CLEANS CHEAPER
with the right equipment for every job

50th Anniversary Medallion



AMERICAN MONORAIL GANTRY CRANE SYSTEM *speeds galvanizing!*



Steel fence posts travel from fabrication to galvanizing over a gantry bridge which interlocks at a crossover track through doorway for passage to the MonoRail crane serving the tanks in the plating room.

All travel on the 4-ton system is motor operated and controlled by push-button station in the operator's hand.

Here is truly team-work handling that results in cost savings as well as increased tonnage through the galvanizing process. It is a typical example of American MonoRail engineering available at no obligation for the solution of your handling problems.

Send for Bulletin C-1 illustrating hundreds of successful Mono-Rail installations.

AMERICAN OVERHEAD HANDLING EQUIPMENT

AMERICAN MONORAIL COMPANY

13102 ATHENS AVENUE • CLEVELAND 7, OHIO

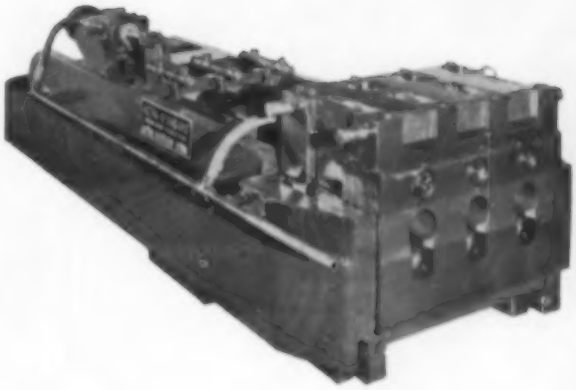
announcing . . .

NEW DRAWBENCH DEVELOPMENT

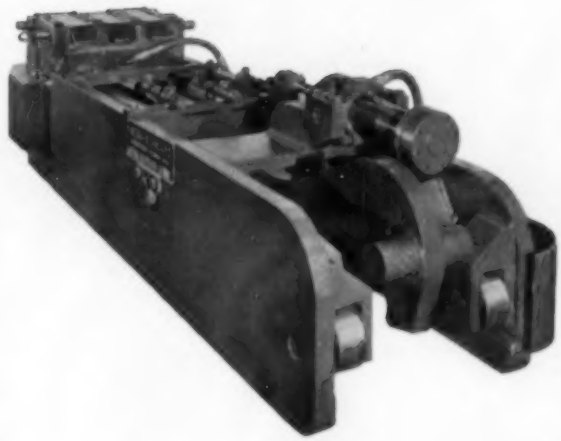
AIR

OPERATED CARRIAGES

AND HOOK



Says an Aetna drawbench customer—"Applying air to the carriages and hook is the greatest thing you have ever done for me."



Aetna has equipped ten benches with air-operated carriages and hook. What about yours?

positive gripping . . .
positive hooking . . .

● Tubes can be drawn at least six inches before air pressure releases the gripping cylinders. This six-inch margin assures a positive grip on tubes. Another advantage — the use of air permits close-up gripping to die stand although the carriage action does not require actual contact with die stand.

Both the carriage and air hook cut down on breakage and maintenance because they eliminate the chief cause — slam-bang action. The cylinder lets the hook down gently and smoothly.

Air-operated carriages, which include many patented features, can be adapted to existing benches of any size. Aetna has interchangeable heads for Aetna's own benches or can adapt the new head to existing benches of other makes. The air-operated heads and hooks can be used for single, double, triple, four- or five-draw.

THE AETNA-STANDARD ENGINEERING COMPANY • PITTSBURGH, PA.

Aetna-Standard

PLANTS IN WARREN, OHIO • ELLWOOD CITY, PENNSYLVANIA

GOOD EQUIPMENT BRINGS DOWN PRODUCTION COSTS

SUBSIDIARY and ASSOCIATED COMPANIES

Head Wrightson Machine Company, Ltd., Middlesbrough, England — Great Britain, Finland, Sweden, Norway, Denmark, Union of South Africa, Northern and Southern Rhodesia.
Aetna-Standard Engineering Company, Ltd., Toronto, Ontario, Canada.
M. Castellvi, Inc., New York, N. Y. — Mexico, Central and South America.
Societe de Constructions de Montbard, Paris, France — France, Belgium, Holland, Luxembourg, Switzerland.
Demag Aktiengesellschaft, Duisburg, Germany — Germany, Austria, Yugoslavia, Greece, Turkey, Egypt.
Compagnia Italiana Forme Acciaio, Milano, Italy — Italy.
Aetna-Japan Company, Ltd., Tokyo, Japan — Japan.
Hale & Kulgren, Inc., Akron, Ohio — Representative for the Rubber Industry.
Standard Engineering Company, Ellwood City, Pa.
Trans-World Traders, Pittsburgh, Pa.

Designers and Builders to the Ferrous, Non-Ferrous, Leather, Rubber, and Plastic Industries

The best way to get the most for your tube steel dollar: *Ask the experts!*

This month's report is on: **2% CR.-MO.**

Has intermediate corrosion resistance in combination with good creep strength and fair resistance to oxidation. For use at temperatures up to 1200°F. in cracking coils, reforming units, heat exchangers, vapor line and hot oil piping, and return-bend forgings for oil heaters.

ONE OF 24 TIMKEN HIGH TEMPERATURE STEELS

Carbon	Sicromo 2	Sicromo 5S	18-8Ti
Carbon-Mo.	Sicromo 2½	Sicromo 5M5	16-13-3
DM-2	2½% Cr.-1% Mo.	Sicromo 7	25-20
Silmo	Sicromo 3	Sicromo 9M	25-12*
DM	4-6% Cr.-Mo.	18-8 Stainless	35-15**
2% Cr.-Mo.	4-6% Cr.-Mo.-Ti.	18-8 Cb	16-25-6**

** Available as seamless tubing on an experimental basis only.*
***Not available as seamless tubing.*

THERE are probably several high temperature tube steels that will solve your heat, pressure, corrosion or oxidation problems. But there's only one that will give you the most for your tube steel dollar—the best life/cost ratio.

The best way to find it is to ask Timken Company metallurgists. They're recognized authorities on high temperature steels. With 23 years of experience behind them, they can help you select your best steel from 24 different analyses. You'll be sure of getting the most for your tube steel dollar. And you'll be assured of uniform quality in every tube because The Timken Company rigidly controls quality from melt shop through final inspection.

For help with your tube steel problems, *ask the experts!* The Timken Roller Bearing Company, Steel & Tube Division, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This photo shows final tube inspection—last of hundreds of rigid tests that help account for the uniform quality of Timken high temperature steels.

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

TIMKEN
Fine Alloy
STEEL

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING